JAN 23 1929

VETERINARY MEDICINE

February 1929

Cattle Practice 46
Veterinary Medical Manufacturing 49
Hyperemic Treatment of Wounds 52
Relation of Parasitism to Live Stock Production 54
Prevention of Shipping Diseases of Cattle 56
Animal Life in Paris 57
Relation of Distemper to Colds 58
Pulmonary Edema of Dairy Cattle 61
Pituitary Hormones 63
Practical Obstetrics 64
Physiological Activities of Cows 66
Practical Surgery 67
Local Medication 69
Vaccination in Kansas 70
Tribute to Professor Kitt 71
Veterinary Students in France 71
Environmental Infections 72
Pyloric Stenosis in the Dog 73
Constipation in the Dog 74
Nebraska Veterinary Problems 76
Caesarean Section in the Cow 76
Diagnosis of Pelvic Fractures in the Dog 77
Diagnosis of Echinococcus Infestation 78
Treatment of Trypanosomiasis in Horses 78
Treatment of Rachitis with Vigantol 79
Pulmonary Lesions in Aborted Foals 79
Control of Grubs in Cattle 80
Food Inspection 80
Longevity of Foot and Mouth Disease Virus 80
Importance of Meat Inspection in Disease Control 81
Etiology of Chronic Coryza 81
Record of 4,214 Operations on Roarers 82
Nutrition and Sterility of the Dairy Cow 82
Electrical Anesthesia of Cattle 83
Comparison of Cow's Milk and Goat's Milk 83
Balance of Acids and Alkalis in Rickets 84
A Superior Anthelmintic for Dogs 84
Success in Distemper Prevention 85
Anesthesia of the Cat 89
Examples of Autophagia 89

No. 2
VOL. XXIV

180 N. Michigan Ave.
Chicago, U. S. A.

At the Fingertips of every Veterinarian

this Nation Wide Professional Laboratory Service

QUALITY-RELIABILITY-SERVICE

Biologics, Pharmaceutics and Specialties of the utmost reliability, made instantly available everywhere.

THE perfection of a standardized service that is necessary to the profession and within the easy grasp of its every member has been the task of Fort Dodge.

The proficiency with which that task has been achieved is best expressed by the confidence in Fort Dodge products and the reliance in Fort Dodge service which is manifested by the veterinary profession from coast to coast.

FORT DODGE

Serum Company

VETERINARY BIOLOGICS AND PHARMACEUTICS

U. S. Veterinary License No. 112

FORT DODGE, IOWA

Veterinary Medicine

VOL. XXIV FEBRUARY, 1929 No. 2

Published Monthly by the Veterinary Magazine Corporation
180 N. Michigan Ave., Chicago, Ill., U. S. A.
$4.00 a Year

Entered as second-class matter November 8, 1920, at the post office at Chicago, Illinois, under the Act of March 3, 1879.

Entered as second-class matter under the title of American Journal of Veterinary Medicine, July 19, 1910, at Chicago, Illinois, under Act of March 3, 1879.

Copyrighted 1928, by Veterinary Magazine Corporation.
All matter appearing in this publication is covered by copyright, and no part of it may be reproduced without permission. Permission will be granted on request for the reproduction of anything in the columns of VETERINARY MEDICINE if the purpose of the reproduction is unobjectionable. Where there is any doubt as to the propriety of reproduction, the wishes of the author will be consulted.

D. M. Campbell, Editor A. T. Kinsley, Associate Editor

Over 20,000,000 chicks valued at approximately two and one-half million dollars are lost annually in Kansas from the time of hatching until ten weeks of age.—"Poultry Survey of Kansas," Payne & Steup.

Of all the occupations which fill the hours of the busy physician, either at the end of the day's toil or between cases, there is not one of greater moment than his reading—medical or otherwise. Through his professional literature he may visit the world and see the work of his entire profession, or call upon the individual known to him personally or by reputation and observe the detail of a single procedure.—*Long Island Medical Journal.*

Cancer is associated and possibly controlled to a large extent by the relative alkalinity of the blood, according to McDonald of the Cancer Research of the University of Pennsylvania. Supporting this theory it is claimed that cancer is extremely rare in individuals affected with acidosis. According to this theory, cancer can be prevented and possibly destroyed in the early stages by overcoming the alkalinity. The administration of drugs that would cause an acidity would be only temporary, permanent protection being obtained only by chemically attacking the sources of alkali in the body. Experimental data will no doubt soon be forthcoming on this important problem.—*Science.*

Tularemia not only affects the human and rabbits, but also mice and possibly other rodents, according to the recent findings of the U. S. Public Service.

The quality of hen eggs is dependent upon the feed. Thus it has been demonstrated that cotton seed meal is a less expensive source of protein than meat scraps, but if more than 10% to 15% of cotton seed meal is used in the feed, the yolk of the egg will be spotted and at times of a very dark color.

Goats are not only of value in production of mohair and supplying chevon but also as a source of a preventive measles serum. The measle serum is prepared by immunizing goats with a coccus which E. A. Tunnicliff of Texas believes to be the cause of measles.

Tetanus anatoxin is said to protect animals for a long period of time against tetanus. By test it has been shown that the subcutaneous injection of 1 cc of tetanus anatoxin will protect a guinea pig against several hundred lethal doses of tetanus toxin given a month later. Two injections of 10 and 30 cc of anatoxin are given at an interval of one month to protect a horse against relatively large doses of toxin. Tetanus anatoxin can be used in preparing a horse for hyperimmunization.

Cattle Practice*

Cattle practice is pretty much like any other type of veterinary practice. You have to work hard to build it up and it seems you have to work even harder to keep it. It is a very exacting type of practice, but it is also a very satisfactory type of practice, both because of the visible results that a veterinarian may obtain and because it is profitable to his clients. This latter, of course, makes it profitable to him.

Inappetence Due to Corn Fodder

At this time of the year we are having a great deal of trouble in Wisconsin from indigestion in dairy cows. We had a poor hay crop last year, and many of our farmers are depending on corn fodder and corn stover for roughage. High producing cows fed exclusively on corn roughage, that is fodder or stover along with the silage, with the addition of some oats or other grain, frequently go off feed without apparent cause. The condition is easily remedied. Give hay. Western alfalfa seems to answer the purpose best. If the cows have not been neglected, and one is called to the case early, they recover promptly.

Impaction of the Third Stomach

Again we see a good many cows go off feed from eating frozen millet or chaff. In these the trouble is usually located in the third stomach and consists of a severe impaction. Unfortunately we get a good many of these cases too late, in our outlying practice. The dairymen in our immediate vicinity have been educated to call us early when any trouble appears in their cows, but in cases 20 or 30 miles away, and in consultation cases, we find these impactions of the third stomach that have gone along until there is complete atony of the organ.

Our treatment for these is one-half ounce of tartar emetic dissolved in two quarts of warm, soft water. Hard water won't do for this remedy. In addition to this, we give a good dose of mineral oil. Any neutral oil is satisfactory, but we prefer white rose. To this oil, we add 20 to 80 drops of croton oil. Usually about a dram. As the condition of the rumen is always dry in these cases, we pass the stomach tube and pump in at least two pails of water, having the owner massage the rumen from the outside while we are injecting the water. We then leave a pint of some mild stomachic for the owner to give. This seems very necessary. A light ginger or capsicum tonic, of which the owner gives one ounce three or four times daily, not only helps the animal, but it goes far to prevent the owner from giving a drench now and again on his own account, a thing that is fraught with danger.

In more severe cases of this same type of indigestion the mouth will be dry as well as the contents of the rumen. In such cases, in addition to pumping a large quantity of water into the rumen, it is necessary to give a salivary stimulant. The cow will not eat or even ruminate if her mouth is dry. Pilocarpin or lobelein sulphate are convenient and effective in such cases. In some cases, one dose of tartar emetic is not sufficient. We do not repeat it, but where further medication is needed, we resort to something else as turpentine, ammonium carbonate or potassium chlorate, and if the case is prolonged we may give all three of them one after the other. One-half grain of eserin and one, two or three grains of pilocarpin sometimes meets the conditions splendidly.

Salt Poisoning

Another digestive trouble we usually see in our outlying practice is the result of giving salt. Farmers sometimes drench their cattle with four, five or even six pounds of salt, and when we see the animals there is a distinct salt poisoning

* Notes from an address by T. H. Ferguson, Lake Geneva, Wisconsin, at the 31st annual meeting of the Nebraska State Veterinary Medical Association, December 11-13, 1928.

present. The same thing happens when cattle are brought in from the pasture and given too much salt to eat, and we sometimes see it from overdoses of potassium nitrate given by the farmer. Where such cases are seen early, they respond nicely to large doses of acetic acid. We usually pass the stomach tube and pump in a gallon of vinegar, possibly more; and a little later, perhaps two gallons or even three gallons of gruel. Unless such cases are treated early, they usually die.

Most cases of inappetence are easy to deal with, but where it is due to impaction of the third stomach, like the cases due to eating frozen millet or large quantities of chaff, it is a very difficult condition to treat. The same result may occur from eating large quantities of any woody feed, and we frequently see it from eating too much binder twine. Cattle will eat some binder twine without harm right along, but if they get a lot of it, it is likely to become impacted in the third stomach.

Indigestion Due to Foreign Bodies

There is another type of indigestion that one sees frequently, and that is due to a foreign body. These cases recover nicely after the removal of the foreign body, provided irreparable damage has not already been done. One is apt to see these cases immediately after parturition. Possibly during parturition the foreign body is moved about and the stomach wall injured or possibly penetrated. Where the veterinarian is called upon at first appearance of indigestion, the foreign body can usually be removed before irreparable damage has been done.

In most cases of indigestion, if the animal doesn't respond from the usual treatment we suspect a foreign body, although in most instances indigestion due to a foreign body is fairly characteristic. But if recovery isn't prompt from the treatment, even where in the beginning we suspected another cause for indigestion, we do an exploratory rumenotomy.

Hoven

Sometimes in cattle fed on alfalfa, we get a dry bloat that we cannot relieve with the stomach tube and then we insert a one-inch trocar and canula. When we use the trocar and canula, we always leave the canula in place for 36 hours. This gives time for adhesion between the rumen and abdominal wall and prevents leakage onto the peritoneum, with a resultant chronic peritonitis, when the canula is removed. We usually insert the canula through a piece of thin rubber, say a section of inner tube split. Then by means of adhesive tape this rubber can be fixed solidly to the surface of the abdomen and in this way the canula can be held in place perfectly for 36 hours.

Rumenotomy

When we do a rumenotomy we always perform the operation developed by Udall. Take a rubber apron and two crochet rings of a little bit greater diameter than the length of the incision we make into the rumen. Put these rings on the rubber apron in the center and then cut out the portion within the inner ring. By squeezing the rings slightly they can be introduced into the rumen and then placed in position and pulled back tightly against the abdominal wall. They form a rubber sleeve or chute so that the hand and arm can be passed into the cavity, and the contents of the rumen removed, without the chance of contaminating surrounding tissue.

Catharsis in the Cow

In our locality, so many dairymen have killed animals by drenching them that now it is a common thing for a dairyman to come into the office and say: "I've got a cow that is off her feed. I think she needs a physic, but I suppose you better come out and drench her for me. I guess I'd kill her if I did it myself."

Where sufficient catharsis is not induced by the first dose of neutral oil to which croton oil has been added, liberal quantities of neutral oil can be given later, but of course, we do not repeat the croton oil. One dose of that is sufficient.

In general, I do not like giving mixtures. Give a remedy once or twice, and then if more is required, give another with a similar action. For the light stomachic tonics alternate ginger with capsicum.

Eversion of the Uterus

Of course, we are called to many cases where there is complete eversion of the uterus. It is best to instruct the owner over the telephone when you get such a call to prepare two milk cans of clean hot water and not to disturb the animal until you get there. On arrival, you should pass a broad board or narrow boards nailed together under the extruded organ. A board about three or four feet long is best. Then have a man stand at each end of the board prepared to lift it when the cow jumps up, and prevent the drag on the uterus from its weight. If she jumps up suddenly with the uterus unsupported, irreparable harm is likely to be done. When the animal is on her feet, and often she can be gotten up best by taking a dog around in front of her and having him bark at her, give her 20cc. of 1 per cent novocain epidurally. Then tie her tail forward and irrigate the uterus with 10 to 20 gallons of warm water.

By this time the anesthetic will be taking effect and the uterus can usually be returned without difficulty. Start with one cornua and follow it right in. Get both horns in place and usually the uterus will start to contract, but even if it doesn't start to contract immediately the animal will not strain until the effects of the anesthesia pass off, and it will usually stay in safely. As an extra precaution, however, we use sutures. I make my sutures up in advance of heavy linen thread and then put them in boiling bees wax to which 10 per cent of phenol has been added. You will never get infection from a suture of this kind. Infection may, of course, be introduced with the suture, but the suture itself will remain sterile.

With a curved needle I insert a suture on each side about one inch from the lower commissure of the vulva and in the same manner opposite the upper commissure. Tie these sutures across to make an X. Ninety-nine cases out of 100 do not require suturing, but the 1 per cent of cases that do require it make it well worth while to use it in all cases.

Prolapse of the Vagina

Prolapse of the vagina is a condition that occurs frequently in very high producing cows, and it occurs also frequently in overly fat beef breeds. In the latter it may be necessary to remove the fat lying just beneath the vagina and causing the prolapse. In all cases, it is very essential to thoroughly clean the prolapsed part. All dirt, and particularly all the mucous exudate should be removed. A good strong solution of sodium bicarbonate is useful as a cleansing agent. Then paint with a 10 per cent lugol solution and suture. Usually there is no further trouble. I use the same style of suture for prolapsed vagina that I use for eversion of the uterus.

However, in dairy cows, one frequently sees prolapse of the vagina caused by stalls that are too short, so short that when the cow lies down the hind parts extend a considerable way over the trough and are without support. It is useless to treat such cases without eliminating the cause, which of course, can be done by giving the animals a longer stall.

Torsion of the Uterus

Cases of torsion of the uterus are, of course, common in any dairy practice. We don't mind them if we get them before the calf dies. Most of our clients have been educated to give us a call immediately if anything out of the ordinary occurs in a cow far along in pregnancy. If you are called to a cow at the time she is due to calf and you observe but slight straining and the vulva is small, it is a good guess that she is suffering from torsion of the uterus. Usually by laying the cow down and tying the legs, the uterus can be righted without much difficulty by rolling her.

Veterinary Medical Manufacturing—Its Future*

By J. H. WEINER, Ph.D., Kansas City, Missouri

THE presentation in the form of facts of interest connected with the production of veterinary medicines is timely because of an increasing desire on the part of the veterinarian for a deeper insight into the scientific and professional phases of this industry and because of the many fallacies and erroneous beliefs that have hitherto prevailed regarding the various portions of this business.

Confusion prevails as to what medicinal agents really are, where they come from and how far they may be reasonably expected to go in alleviating the diseased conditions to which the animal body is susceptible.

The topics and subject matter making up this paper have been inspired by the interrogations and discussions that I have encountered during my past eight years of most daily contact with members of your profession.

Veterinary medical manufacturers should outline a most ambitious program for honesty in manufacturing. Many evils have existed. It might well be asked why their correction was not long ago undertaken.

It is one of the most unfortunate characteristics of business, prevailing to an unnecessary extent as a usual thing, to fear, to stand four-square against the insidious or open machinations of competition. The complacence of business makes all the more noteworthy any dicta condemning unscrupulous practices. To condemn, by expressing in full realization of the injury done to the entire veterinary profession, practices which in truth have not been part of, the entire profession would not be possible without the assistance of you gentlemen.

The cynical group of philosophers of an early Grecian school gave voice many years ago to the opinion that "a man could not be wholly honest and remain in business."

Philosophers of a later school declare that men of high intelligence cannot be a success in business because they will not lend themselves to certain practices which are all too widely accepted as being prerequisites of profitable commercial undertakings.

These statements, of course, are of the nature of most such generalities. Some still in fact exist: but business as a whole is not trickery and dishonesty. The ramification of veterinary medical manufacturers in the channels of general business are widespread.

Therefore the attempt of honest manufacturers to make honest products turned to honorable ends is certain to be of wide influence. As an influence for the good of the veterinary profession it cannot be too wide—if one may judge the need for reformation on the basis of the number of evils against which the veterinary medical manufacturers have declared.

Developments in the industry within the past few years have been of such fundamentally influential nature that it has been well that the industry has been prepared for the study of new things and the dissemination of information concerning them.

To this, as much as, if not more than to anything else, is to be laid the success and future of veterinary medical manufacturing in keeping abreast of the times.

It is best to be forearmed with knowledge of industrial trends be they matters of supply and demand of new products or of application of these products to your profession.

One veterinary manufacturer is a pioneer in the recognition of the value of research and in the cooperative undertaking of such research. It is greatly to the credit of this manufacturer and the industry he represents that he has paid his own way in research. His latest decision to finance cooperative research stands out in marked distinction.

What should be the rapid strides in the development of veterinary medical manu-

* Presented at the 31st Annual Meeting of the Nebraska Veterinary Medical Association, Omaha, Dec. 11-13, 1928.

facturing? What is being done now? What are we going to do with the future which is ever imminent?

One of the most important steps that should be taken toward the betterment of this industry is the employment of chemists of recognized ability. It cannot be denied that the chemist would serve this industry most essentially. Progress and industry owe as much to this scientific influence as to any other. It could not be denied that the chemist conversely would owe much to the veterinary manufacturing industry and its incentive to research for its support of scientific endeavors and for its employment of scientific workers. The veterinary medical chemist will owe a bounteous debt of gratitude to you men of the field, for it is you who will perfect his knowledge.

Logically and obviously the two parties to such an intimate and interdependent relationship should be fully informed relative to each others' point of view as well as requirements and possibilities.

In the world today there are 16,148 chemists so recognized as members of the American Chemical Society. For years the veterinary medical manufacturers could not claim a single recognized chemist for their own. Today they claim four, three partly interested and one wholly interested.

The veterinary biologist - bacteriologist-pathologist-pharmacologist would be wholly at a loss in the thoroughgoing effort to chart seas of disease and health without the aid of the chemist to study minutely and exhaustively these chemical questions which form the very breath of life.

Centuries ago the chemist and the physician cooperated closely for the alleviation of suffering. The chief aim of chemistry in those days was the providing of medicinals for the use of the physician. Then the physician and the chemist separated, the physician looking more and more to other means to effect his ends, while the chemist turned to the production of wealth in the industries. Later the physician turned back somewhat to his former aid and found most useful substances awaiting him. For instance, ether had been discovered in the thirteenth century but its value as an anesthetic was not definitely recognized until 1846. During the intervening five or six hundred years untold suffering resulted from lack of knowledge of its application in producing insensitiveness to pain. Magnesium sulphate was well known to chemists in 1694, but two hundred years elapsed before we were acquainted with its therapeutic uses. Twenty-three years elapsed between the discovery of amyl nitrite by the chemist and the discovery of its medicinal properties by the physician. During this period tens of thousands of human beings suffered the tortures of angina pectoris because the chemist, pharmacologist and physician were not working together.

We do not want such a condition to prevail in veterinary medicine. The chemist wants to work with the veterinarian and the veterinarian should welcome this spirit of willing cooperation for mutual benefit.

There are big problems in the veterinary medicine manufacturing industry today. The revolutionary changes to new raw materials is a matter of universal importance. The application of old products to new uses is equally important. The necessity of volume production for the sake of economy has not become understood to the extent that it demands.

Gentlemen, how well I remember some years back my first association with this industry. How well I recollect how the enormity of error, the labyrinth of incompatibility and the unconscious therapeutic inactivity stunned me. I was fascinated by the fact that so large, so important, so vital an industry had been traveling so long in the maze of manufacturing inaccuracy.

The stupendous misuse of materials and the lengths to which manufacturers went to produce products so simple in nature was still further alluring to me and accounts for my present activity.

When I think years ago of what was produced and called "boluses" I feel like shedding scientific tears. Think of it as hard as concrete—absolutely insoluble. The animal body serving only as a means of conveying it from the mouth to the ground. Gentlemen, it is nothing to laugh about. It was

indeed sad that such unscientific medicine was foisted upon such intelligent men. Here it is today, thanks to research. Thanks to the industry seeking its own betterment.

There was a drench containing barium chlorid, nux vomica, gamboge, lobelia and epsom salts. I asked the manufacturer of this product some years back what single ingredient was the essential one in this mixture and the answer was "barium chlorid."

When it was mixed with water you would notice a heavy white sediment. Well, that is your barium chlorid! It interacts with the magnesium sulphate and forms barium sulphate, chemistry's most insoluble compound.

Isn't it sad to think that for years a reputable manufacturer put this product out? But, gentlemen, science has shown him the light and we now have the same mixture today in solution and you can believe me, gentlemen, that barium chlorid is in this product as barium chlorid.

Some years back I had occasion to analyze some veterinary ointments containing some pretty potent ingredients. We took samples of this ointment from eight different parts—that is to say, from the surface, in the center, the bottom and the sides, etc., and made analysis of each part, and lo and behold not one of them resembled the other, showing how improperly this ointment had been mixed, with no attempt to distribute its active ingredients evenly throughout the base. We guard against such things today in veterinary manufacturing. We have special equipped mixers that mix the ingredients thoroughly —and not satisfied with this, we mill the final ointment through a steel mill under enormous pressure so as to disseminate thoroughly all medicinal agents throughout the base. Such is progress.

I have in my laboratory samples of tablets for use in veterinary medicine that have laid in water acidulated with hydrochloric acid for over two weeks and have not as yet dissolved. I have tablets that while the basic formula is correct, in solution they cause the formation of toxic substances. I have tablets containing that valuable ingredient Santonin—yes, thirty-three samples of them obtained at different periods over the past three or four years and only one of them is true to formula. But these are things we are trying to guard against, not only now but for the future. Some of these conditions, and I would say most of them, are due to ignorance of proper manufacturing methods and calculations. Very little is due to intentional adulteration.

And that is not all. There are hundreds of such incompatible and manufacturing monstrosities that, by hard and diligent research and work with your assistance, have been abolished. It has taken years to do it and now we are working on the threshold of the future. We are devoting our unbending energy and undaunted spirit to the betterment of the good products and to the introduction into veterinary medicine, of medicines that embody the scientific development of today, inasmuch as they represent not any more the old handed down from father to son formulas which were relics of empiricism, but accurate blending of compatible ingredients for the diseases in which they are known to have merit. The science progresses and the old methods are no longer recognized.

Gentlemen, the veterinary medical manufacturing industry is marching forward. Its standard bearer is science, its soldiers scientific workers, and its music the Marseillaise of the veterinary profession, "Further Research."

Let us all sing the hymn of Progress. Let us all lay aside the swords of competition and turn them to plowshares of uplift for the profession.

There are thousands to tell you it cannot be done,
There are thousands to prophesy failure,
There are thousands to point out to you, one by one,
The dangers that wait to assail you.

But just buckle in, with a bit of a grin,
Then take off your coat and go to it.
Just start in to sing as you tackle the thing
That "can not be done"—*and you'll do it.*

Hyperemia Produced by Subcutaneous Injections of Tincture of Iodin as Treatment of Severe Wounds*

By DR. LAGAILLARDE, Captain Veterinary Corps, French Army

INJURIES that penetrate the skin and underlying tissues permit the virulent attack to pass the first line of defense. The second line of defense—the white blood corpuscles and the bactericidal effects of the body fluids are therefore called upon. These forces are brought into action by the developing inflammation and ensuing vaso-motor dilation, which brings up cellular as well as humoral defensive forces to resist the aggressive invaders. The phenomena of vaso-dilation, which are fundamental causes of all leukocytic action, are, according to S. Arloing, Bonchard, Charrin, caused by toxins. This explains why reaction to any injury is not immediate, but requires time to develop. Often the intensity of inflammation is too weak and does not bring forth defensive forces strong enough to defeat the invaders, or to localize the damage.

From a therapeutic viewpoint, it would therefore be of advantage to produce, in case of a severe wound, that may be followed by serious consequences (complications), almost immediately, a violent inflammation. The phagocytes, appearing in immense numbers, will have to combat a relatively small number of invaders, who have not had time to develop their means of attack and defense—the toxins. Even after the disease process is established there is still need, in order to increase resistance, for a great number of phagocytes as well as tissue fluids.

We produce an active, rapid, violent hyperemia by means of four or five subcutaneous injections, each of 1.5cc. of diluted tincture of iodin, at several points surrounding the wound. They are made at a distance of 6 to 8 cm. (2½-3inches) from the injury.

A marked edema develops rapidly all around the wound; it disappears between the 7th and 10th day. On account of the antiseptic properties of the diluted tincture of iodin, it is not necessary to sterilize the syringe or to disinfect the skin.

We have used the pure tincture of iodin in doses of 1cc. for each injection. This caused a few benign abscesses, due to the necrotic action of the iodin. We therefore prefer to use tincture of iodin that has been diluted with an equal amount of water. Each injection consists of 1.5cc. of this dilution.

Numerous cases which we have treated by active hyperemia produced by this method permit us to draw the following conclusions:

In cases of open wounds, the consequences of which may be grave, especially those in the regions of the articulation and tendons so often found in horses (horses in the army) it proves to be a useful, economical, effective therapeutic procedure. As a rule, the wound receives no other treatment, if it is aufractous, sinuous or extensive, the usual therapeutic remedies as well as surgical means should be applied besides the active hyperemic treatment.

Reports of Especially Serious Cases

Case No. 1—Penetrating wound on the inner aspect of the hock. Articulation open, synovial discharge; patient kicked five hours previously. Received four sub-

* Translation from Revue Veterinaire et Journal de Medicine Veterinaire, Vol LXXX, October 1928, pages 544-547, by C. H. Schultz.

† The author uses "edema" to designate swelling caused by subcutaneous injections of tincture of iodin. Since the swelling is of an inflammatory type, I have translated it as "swelling." Edema is non inflammatory.—C. H. S.

cutaneous injections of tincture of iodin around the wound. On the following day marked edematous swelling on inside of leg and region of cannon. Healed in about 10 days.

Case No. 2 — Voltigeur (name of horse). Examined September 25th. Kicked on outside of fetlock, posterior extremity; injured yesterday evening. Scarcely any weight carried by leg. Received four injections of 1cc. each of tincture of iodin, at points surrounding the injury, about 5 cm. from it. On the next day extensive swelling,† surrounding the fetlock, the cannonbone and the phalanges. On the 28th, lameness almost nil, swelling persists, cicatrization of the wound has progressed nicely. October 3rd edema has entirely disappeared, healed.

Case No. 3—Marbot, five years old. On September 30th, the saddle slipped under the belly. The horse threw itself on the pavement, receiving on the front of the right knee a large and deep laceration. The ligaments are torn, articulation is open. A grave injury; suppurating arthritis would probably prove fatal (under ordinary treatment). Immediately after the accident we made, surrounding the lesion, five injections of 1.3cc. of tincture of iodin. Applied tincture of iodin and powdered permanganate of potassium to the wound. In an hour, the edema is marked; serous discharge from the injury. During the following days, extensive swelling in the region of the knee prevents flexion; carries weight almost normally; slight suppuration from the wound.

On December 5, 1927, swelling persists, the wound is granulating; from the center the necrotic tendinous parts begin to separate. We make two injections of tincture of iodin of 1.5cc. each, on the sides of the knee, a little below the lesion.

On December 9th, the wound is granulating, the necrotic parts in the center continue to disintegrate; the swelling persists, preventing flexion; support is normal.

On December 16th, two small abscesses near the place where the injections were made, appear.

On December 20th, the wound is flat (plate), swelling reduced, but still noticeable. On January 10th, the knee appears normal except over the region of the rear, under which an exostosis is formed. The horse went to work.

Case No. 4—Affrande. Ran against a gun carriage during iron (tige en fer du böt) maneuvers. The stirrup iron was driven through the skin on the outside of the horse, and penetrated deeply into the articulation. The mare ran a kilometer and stopped, could scarcely carry weight on the leg. Four injections of 1cc. each of tincture of iodin around the wound. The cripple hobbled painfully to the next village and was left there. Good recovery in about ten days.

Case No. 5—Qui-va-la. Penetrating wound, caused by a kick on the lateral aspect of the posterior fetlock. Four injections of 1.5cc. of the diluted tincture of iodin, equal parts of water and tincture of iodin; during the following days marked swelling, extending to the hock. Recovery in 12 days.

Case No. 6—Buche. Kicked near the internal malleolus of the tibia, slight swelling, marked lameness; injured 48 hours ago. Five injections of 1.5cc. each of the diluted tincture of iodin. Thirty minutes later the swelling is twice as large. On the next day the swelling is greatly increased, extending upward on the inside of the leg and downward on the cannon. Lameness but slight. Five days later the swelling has disappeared, the mare goes to work.

Case No. 7—Neva. On April 15th, during maneuvers, the horse was kicked on the inside of the hock. Was treated with large vesication application. On the 20th of April the horse suddenly developed severe lameness, indicating danger from arthritis. Four injections of 1.5cc. of the solution of tincture of iodin were made. Two hours later, marked swelling. On the 21st, extensive swelling; recovered on the 27th.

Relation of Parasitisms to Live Stock Production*

BETWEEN a parasite and its host there is a good deal of mutual tolerance, the parasite has learned to live with the host and the host with the parasite. A neutral balance is maintained but when a parasite is able to infest a new host we usually get a surprise. A gapeworm infestation of turkeys and chickens illustrates this. Turkeys are only annoyed by gapeworms. Usually they will live a long time with gapeworm infestation. Chickens, on the other hand, when infested with gapeworms either die rather quickly or they overcome the infestation. We therefore assume that the turkey is the normal host of the gapeworm and that the chicken is a new host, a host in which a mutual tolerance or neutral balance has not been established. The parasite either overcomes and destroys the new host, or the host overcomes and destroys the new parasite.

Salmon poisoning in dogs, which is a nemotode infestation, is another type of parasitism in a new host.

Under normal conditions, hosts are very tolerant of their parasites. Nature didn't expect domestication when she produced parasites and hosts. When hosts succumb or are greatly injured by their parasites, it is usually due to infestation with unexpected numbers.

The function of a parasite is reproduction. That may be said to be the function of all plant and animal life, but the parasite has become modified and specialized until reproduction represents about all there is to life for it.

Since in nature, with animals almost never existing in large numbers in a given area for any considerable length of time, the chances for survival of the species on the part of parasites are very slim, they therefore produce eggs in enormous numbers. When man enters the scheme of things and confines hosts and their parasites on restricted areas, the result is an exceedingly heavy infestation and the original balance between parasites and hosts is broken down.

The loss from parasitisms of domestic animals is unbelievably large. For example, cattle harbor 100 species of parasites. Let us examine the loss from a single species, take grubs. It is estimated that the loss of flesh in infested animals averages $5.00 per head. Others have put the loss as low as $1.00. Certainly a very conservative estimate.

It is believed that at least 25 per cent of all cattle in the country are grubby, and probably 50 per cent would not be an overestimtae, but, let us take the smaller estimate and apply it to the 60,000,000 head of cattle in this country. If only 25 per cent are infested and the loss in flesh is only $1.00 each, the sum is $15,000,000. To use the higher estimate, 50 per cent infested, and a loss of $5.00 each, the loss amounts to $150,000,000 annually.

If we assume that 10 per cent of the milk production is lost as a result of grub infestation, it amounts to $30,000,000 annually. Grubby hides are certainly worth on the average 1c less per pound than hides without grubs. This amounts to $9,750,000 annually on the hide crop. The loss on slaughtered cattle from trimming out the parts damaged by grubs is entirely unknown. At the smallest estimate, the total loss from grubs is $55,000,000 a year. At the higher estimate, it is $200,000,000 a year.

Dr. Maurice C. Hall went over the monthly reports for October 1927, received from inspectors in charge at packing houses where federal meat inspection is maintained. In that single month

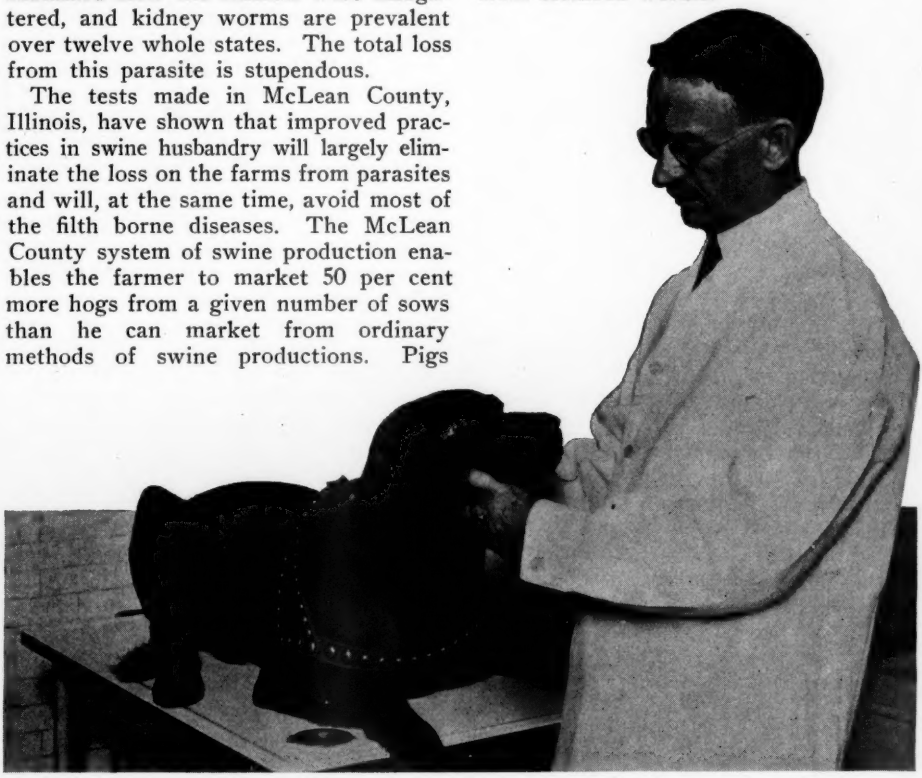
* Notes from an address on "Relation of Parasitism to Live Stock Production," by Benjamin Schwartz, Washington, D. C., at the 31st annual meeting of the Nebraska Veterinary Medical Association, Omaha, December 11-13, 1928.

100,000 livers having a value of $150,000 were condemned. The loss each month is probably as great.

Dr. E. M. Nighbert kept account of the loss from kidney worms in swine in a small packing house in Moultrie, Georgia, for six days. In that one week, 19,406 pounds of pork was condemned for kidney worm infestation. Its value was $1,584.95. The tankage value of the parts trimmed out was $48.73, leaving a net loss of $1,536.22, or a yearly loss of $80,000, in that one small packing house from kidney worms in swine, and that was by no means all of the loss. It did not take into account the loss of condition in the hogs or the loss of hogs before they reached the packing house, but only the loss that was sustained after the animals were slaughtered, and kidney worms are prevalent over twelve whole states. The total loss from this parasite is stupendous.

The tests made in McLean County, Illinois, have shown that improved practices in swine husbandry will largely eliminate the loss on the farms from parasites and will, at the same time, avoid most of the filth borne diseases. The McLean County system of swine production enables the farmer to market 50 per cent more hogs from a given number of sows than he can market from ordinary methods of swine productions. Pigs raised without parasites were ready for market seven weeks earlier than infested pigs, and at four months of age they weighed 28 pounds more than infested pigs. It is estimated that parasites are responsible for 10 per cent of the entire live stock loss of the country.

Dr. Cooper Curtis studied stomach worms in sheep in Virginia for ten years, and worked out a plan of rearing lambs by which he could avoid the loss from this parasite. He then took 100 ewes to McNeil, Mississippi, and lost 80 per cent of his lamb crop from stomach worms the first year; but changing the plan to dose the lambs with copper sulphate every two weeks instead of every three weeks, he was able the second year to avoid loss from stomach worms.



Dr. David E. Buckingham, Washington, D. C., examining a dog offered Comdr. Richard E. Bird for his Antarctic Expedition. The 95 dogs taken on this expedition were given the serum and antigen treatment for the prevention of distemper.

Cattle In Transit*

Avoid hard driving and allow ample time for rest before loading. On arrival at the pens, the animals should not be allowed to fill up on water, but should first have rest and be fed some native grass or nonlegume hay.

Avoid overcrowding cattle in the cars. In cold weather, bed the car well. In very severe weather, in northern latitudes, i may be well to line the side walls of the car with heavy paper, especially in the case of young or unthrifty cattle.

Give feed and water at proper intervals en route. When unloaded for feed, water, and rest the cattle should have plenty of time ot become well rested.

Under the 28-hour law five hours' rest is the minimum specified time, and the railroads ordinarily allow that period, exclusive of the time of unloading and reloading. It is better, however, to give stocker and feeder cattle special care, allowing at least eight hours for feed, water, and rest.

In the case of stocker and feeder cattle that pass through the public market, the same attention should be given to the shipments back to the country. Following the arrival of cattle at final destination in the country, they should receive special attention and care to help them over the period of lowered vitality resulting from the hardships of travel.

Feeder cattle on arrival should be given a fill of dry roughage, such as timothy hay, prairie hay, or corn stover. After having access to this roughage a few hours, they should have water but not all they will drink.

Most feeder cattle are raised on grasses different from those found in the fattening areas. Therefore, if they are to be pasture fed, let them become accustomed to the new grasses gradually, giving them at first only a few hours' grazing each day, especially if the grass is still green.

Use of Biological Products

For the guidance of stock owners and veterinarians who in the past have used various biologics to prevent hemorrhagic septicemia or to control outbreaks—often with disappointing results—the committee makes additional recommendations for the proper use of such products.

Best results may be expected if producers arrange to have their feeder and stocker cattle treated, either with bacterins or with aggressin, at least 10 days before shipment. Bacterins and aggressin are used to establish immunity and thus prevent development of the disease. A very satisfactory immunity may be expected in 10 days after treatment with either bacterins or aggressin. Emphasis is placed on treatment *"at least* 10 *days before shipment"* since experimental work by the Bureau of Animal Industry and other agencies tends to show that the administration of bacterins or aggressin to animals while in transit does not reduce losses from the disease. There is some evidence that in the case of aggressin losses among cattle so treated while in transit are greater than among untreated animals.

Accordingly, the treatment, with aggressin, of feeder and stocker cattle in transit or within a few days after they reach their destination should be discouraged, and the treatment of feeder and stocker cattle with bacterins during such periods is of little or no value.

Anti-hemorrhabic-septicemia serum, however, possesses some curative value and is regarded as the most desirable product for treatment of cattle in transit or within a few days after they arrive at destination, especially if some of the animals in the shipment already show symptoms of the disease. In all cases where veterinary biological products are used they should be administered by competent veterinarians.

* From the report of a to aid in reducing the heavy losses of cattle in transit from hemorrhagic septicemia and other ills incident to shipping. The committee is composed of E. C. Brown, representing the National Livestock Exchange; Charles E. Day, the National Traders' Exchange; Dr. W. J. Embree, representing the Western Weighing and Inspection Bureau, and the railroads; L. W. Kube, representing public stock yards; and F. G. Ketner, the National Livestock Producers' Association. Though not a member of the committee, Dr. A. W. Miller, chief of the Packers and Stockyards Division of the Bureau of Animal Industry, United States Department of Agriculture, attended several of the conferences by request and otherwise acted in an advisory capacity.

Animal Life in Paris

By CAPTAIN GEORGE CECIL, Paris

Well Kept Beasts of Burden; the Petted Hound; Aged Donkeys

ALL the world must have heard of the Champs Elysées, the pride of Paris, which according to noted authorities, are singularly attractive, Hyde Park, London, The Eden Gardens in Calcutta, the Cinnamon Gardens in Colombo, the Public Gardens in Jaipur, the Butchart Gardens of Victoria; none, despite their undoubted lure, can touch the combined park and garden which is the joy of Paris. And the animal life of the Champs Elysées is a delight; one never tires of studying it.

First and foremost come the donkeys, bestridden by the little people. Staid and elderly animals are they, several of whom have their regular clients...."What, my grey donkey with the wall-eye is not free? Truly, this is too annoying," declares Toto, aged six, with many an expressive French gesture....."Take another just as good? Ah, no! Me, I have been hurried through my lunch by Nurse so as to be first in the field, and this is how you treat an old customer!!!" Fortunately for the good of his pocket, the proprietor of the mokes is not wanting in tact, and he readily finds a way out of the difficulty. "I am indeed desolated to have mistaken the hour at which Monsieur signified his intention of honoring me with a visit. But will not Monsieur whom is so good a judge of donkeys and so fine an equestrian, try my new purchase—an exceptionally valuable animal of Syrian descent....." "Not so bad," says the petulant sportsman, critically running his eye over the steed's points..... "Truly, your choice does you infinite credit....." It will be observed that Paris children are fond of using long words; indeed, the diminutive Jean and Jeanette express themselves in grown-up phraseology almost as soon as they are able to talk. 'Tis the custom of the country.

Some of these donkeys must have been plying for hire almost since the Champs Elysées were first laid out. One corpulent Neddy, for instance, certainly has accommodated diminutive Parisians for at least three decades, while another, a dun-colored beast, meek and mild in character, is equally well known to several generations. The animals, by the way, are kindly treated by their owners. Sleek and well kept, they lead a pleasant existence. Raymond (called after M. Poincaré), Sara (the late Sara Bernhardt was the godmother), Mimi, and the others may be on the go most of the day, but the pace is not killing. The wily proprietor does not encourage anything more violent than a gentle amble, since heating exercise tends to leanness. Thin donkeys seldom appeal to the knowing connoisseur; besides they jog the rider.

Very small ponies sometimes make their appearance. The mokes, however, are preferred by anxious guardians, who, convinced that a pony may prove refractory, are all for safety. Fearlessness is not instilled into the young Parisian.

Those Playful Goats

To the very tiny children, the goat carriages are the chief attraction. The conveyances (of the same time-honored make as those to be found at the English seaside) are drawn by hoary goats who, like the donkeys, have adorned the Champs Elysées for a considerable time. There is, in fact, one ancient billy, snow-white and blue eyed, who was showing signs of age before the war. Lately, he has grown younger, and each passing week renders him giddier and giddier. These engaging creatures are as tame as

Mary's little lamb. Used to being fed by their hirers, they will come to anyone who holds out a hand, expecting to find in it some luscious tit bit. Should the hand be empty, the disappointed goat's expression is a mixture of contempt and reproof, a playful butt, as a hint that practical jokes are considered odious, being thrown in. The billies and nannies of the Champs Elysées must not be trifled with.

The carriages are constructed to hold two or four passengers. The really chic infant takes a carriage all to itself and, with the observant nurse marching alongside, drives in solitary state up and down the broad walk. Less well-to-do kiddies look on enviously.

Dogs of Sorts

Except that they include vast numbers of the most astonishing mongrels ever pupped, the Champs Elysées tykes are much the same as those to be seen in other countries. The handsome, chien begger (sheep-dog) is the most popular, though the ubiquitous French bull dog, an engaging pet, is as sought after as any. Toy dogs of all shapes and breeds scamper up and down the lawns; and if there is the slightest chill in the air, the shivering little Azor wears a great coat. The fanciful garment usually is embroidered with the initials of the proud owner, who, if of that highly objectionable class, the nouveaux riches, may cause the border to be heavily braided with gold. Anything to make an ostentatious display.

Much care also is bestowed upon the color scheme of the wrap, a tint which harmonizes with the pampered wearer's charms being chosen. One may, for example, find a fawn pug decked out in an indigo blue coat, while a black garment edged with cerise ribbon was recently seen adorning the overfed body of a self-conscious white poodle. If the dog's mistress is a marquise, the coat may be finished off with a coronet. This form of snobbishness turns less highly placed fanciers green with envy.

As to the mongrels, they are absolute horrors, without a single redeeming feature. Still, their fond possessors cherish them, lavishing upon Coco and Fifi every possible term of endearment..... "My sweetest! My roseleaf! Art thou, then, fatigued? Would'st thou go to bye-bye on mother's lap?"

Pussy Cats Are Scarce

One never, by any chance, finds a cat in the Champs Elysées, not even at the restaurants. Elsewhere in Paris grimalkin may be seen; blacks, whites, tabbies, tortoise shells, greys and nondescripts decorate the city in rich profusion. But the mouser keeps away from the flower beds, rockeries and what not. Pigeons, on the other hand, abound while sparrows are as plentiful as the grubs on which they thrive. Extraordinarily tame, they hop onto the railings at your elbow, and take the breadcrumbs which are offered them.

For some years an elderly Parisian has spent hours every day feeding the birds, who fall on him the whole length of his walk, circling around him and perching on their benefactor's shoulder. The guides point him out as one of the sights of Paris, and the Republic has bestowed upon this charitable person the little red button of the Legion of Honour. He deserves it more than do many of those who are honoured for nothing.

The pigeons are said to be the fattest ever seen. As a matter of cold fact, those which strut about the Plazza di San Marco in Venice are equally plump and prosperous looking. But the Parisians will not allow this—doubtless because they dislike the Italians.

A conservative estimate of the cost of quack "cures" to the farmers of the state of Wisconsin is $1,000,000, according to B. A. Beach, veterinarian at the state university and secretary of the Wisconsin Veterinary Medical Association. This sum is equal to, if not greater, than the cost of the entire tuberculosis eradication campaign in the state.

Canine Distemper and Its Relationship to Human Infection

By ARTHUR H. BRYAN, Baltimore, Md.

THE article entitled "Is Canine Distemper a Danger to Children?" written by the writer, aroused some comment from veterinary and medical men. One well known veterinarian seemed to consider that anything seeking to relate canine distemper to human infection had a tendency to hurt the canine industry, and possibly the small animal practitioner. In view of very recent developments resulting from the research work of the British Distemper Commission relative to the control of canine distemper, the Pasteur, and AsheLockhart, Kinsley and Cutter laboratories' announcements regarding homologous hyperimmune serum together with the antigen in conferring an immunity of long duration, it would appear that both the canine industry as a whole and certainly the veterinary practitioner will not lose through the public knowledge of the possible danger of the disease to man. Vaccinations as soon as proved beyond doubt to confer immunity would be as common as small pox vaccination in the human, and the stimulus to securing an immunity against distemper would be hastened by the knowledge of its possible transmissibility to man.

The writer concluded his paper with a request that the big research institutions at present working on colds and allied infections give some time to canine distemper, as the similarity between the two groups of diseases from a clinical, bacteriological, pathological, and etiological standpoint, had so many factors in common that a study of canine distemper might shed light upon colds, coryza, la grippe, influenza, pneumonia, etc. It was therefore with gratification that the writer learned that the research workers at Johns Hopkins Medical School, who are engaged in a study of cold and influenza problems, confirmed the clinical observations of the writer, stating that organisms present in canine distemper are transmissible to the human.

Dr. Hugh Spencer, commenting on my article, stated that there are possibilities of throwing some light on colds and allied infections, by a study of the vaccinations being used in distemper control. (Doctor Spencer is professor of pathology at the University of Maryland.) Dr. Louis Vogel, Baltimore medical practitioner, and pneumonia specialist, stated that his long experience as a medical practitioner in connection with colds and pneumonia, in the human family, has led him to the conclusion that animals suffering from canine distemper are undoubtedly a source of infection to the human.

Charles G. Bryan, M. D., F. R. C. S., Llwymypia, Wales, stated that he was very interested in the article on the infectious nature of distemper, and that he personally agreed with the tenure of the article. He stated that in his opinion, however, veterinarians are dealing with several diseases all classified under the head of distemper and that it was closely allied to the infantile diseases of the ultramicroscopic virus type such as scarlet fever, measles, acute rhumatism (fever) and chorea (St. Vitus dance). The general symptoms of the various types of distemper correspond very closely to these diseases and probably give a reason why distemper can recur in the same way that scarlet fever confers no immunity against measles.

This comment by Doctor Charles Bryan, formerly of the University of Southern California, and post-graduate in Europe at present, opens up still another problem in "What is the relationship between the infantile filterable virus diseases enumerated above and canine

distemper?" The veterinary profession will assume still greater importance from a public health standpoint, and receive still greater recognition as a public servant, in proportion to the service it renders in controlling human, as well as animal diseases. One of the greatest surprises to the veterinarian is the impetus accorded the dairy farm industry, following the war on bovine tuberculosis. The veterinary practitioner has gained prestige, as well as added practice, due to his necessary service in controlling the disease, because he is serving the public from a health standpoint, and the writer feels that the same will apply to canine distemper, in its relationship to public health.

POULTRY DISEASES AND THEIR HANDLING*

Beginning with the chick in attempts to control or eradicate bacillary white diarrhea is beginning at the wrong end. The mature bird is the carrier of the infection and we must first get rid of the mature infected birds to accomplish anything worth while in the handling of this disease.

It should be remembered that a single agglutination test will not pick out all of the infected birds in a flock, neither will a single pullorin test. If but one test is to be used, the agglutination test is probably to be preferred to the pullorin, but if two or three or four tests are made, the results from the agglutination and the pullorin tests will be equally satisfactory.

Veterinarians on the whole do not take poultry practice nearly so seriously as its importance justifies. The younger men are more interested in it than those who have been established in practice for a number of years, but they are no better qualified for this practice. It appears that poultry pathology is not so taught in schools as to prepare veterinarians adequately to handle the diseases of either farm or commercial flocks. But, those who give serious attention to poultry practice, in most instances, speedily qualify themselves to handle it adequately.

The hatchery men are very much in earnest in eradicating bacillary white diarrhea and other diseases from their flocks, and they are going to have a lot of testing done. If the veterinarians don't or won't do it, somebody else will.

Nutritional diseases are very common, particularly at this season, and many conditions supposed to be infectious are basically due to nutritional ailments. In a general way, one may say that where deposits of urates are found in the kidneys and ureters, a nutritional deficiency is responsible. Such birds should be given yellow corn, leaves of alfalfa and cod liver oil. Where the muscles are light colored and there is some paralysis in the flock, the trouble is likely to be found to be due to a vitamin C deficiency. Rickets and paralysis—a softening of the bones of the face and the sternum, is usually due to a vitamin D deficiency and of course, calls for cod liver oil and more sunlight.

Parasites cause a great deal of loss in poultry flocks. Tapeworms are the commonest and the most difficult to remove. The larger tapeworms, those from one inch to and inch and a half long are easily removed with kamala, but with the small tapeworm, it is a different story. These worms are often so deeply imbedded in the swollen mucosa that kamala or other anthelmintics fail to reach them; but if they are first dosed with epsom salts and then starved for at least twenty-four hours, kamala will remove a large part of them and usually result in marked improvement.

Coccidiosis is a menace to the raising of young chicks. The use of bichlorid of mercury in the drinking water and feeding powdered milk or lactose is an efficient remedy for coccidiosis, but the principle objection to it is its expense.

Leukemia is very common in poultry and is sometimes mistaken for tuberculosis. Very little is known about leukemia in birds. It may or may not be infectious.

* Notes from an address on "Poultry Diseases and Their Handling" by Frank Breed, Lincoln, at the 31st annual meeting of the Nebraska Veterinary Medical Association, Omaha, December 11-13, 1928.

Pulmonary Edema and Hemorrhagic Septicemia in Herd of Dairy Cattle

By GEORGE H. CONN, Freeport, Illinois

ON SUNDAY morning, Dec. 9, 1928, a cow in a herd that has been under my supervision for two years, refused to eat; there had been no indication of any abnormal condition in this herd. Examination of this cow revealed a very severe pneumonia with a temperature of 106.2° F. Further inspection of the herd showed two other cows in the same condition. These cows were in a large barn where 35 cows in milk together with some bred heifers were stabled. Inspection failed to show any other animals affected.

The affected animals were isolated at once and their stalls thoroughly cleaned and disinfected without delay.

No animals had been shipped into this herd for more than a year and while parts of the herd was exhibited at some of the leading shows this fall, the last one had been returned at least six weeks before this outbreak occurred. No forage is purchased for this herd, although considerable mill by-products such as middlings, bran, oilmeal and cottonseed meal are purchased. The weather had been very changeable for several days before this outbreak, there being considerable drop in temperature, followed by thawing. It was sloppy under foot, at the time, closely resembling spring weather. The herd was turned out for about one and one-half hours during the afternoon of December 7th. Visitors call at this farm nearly every day and they come from many states of the corn belt as well as from greater distances. No source of the infection could be determined.

The general symptoms shown by these three cows were as follows:

1. Loss of appetite.
2. Mucous nasal discharge.
3. Difficult breathing, with little rib movement.
4. Much pain due to breathing.
5. Rapid decline in milk production.
6. Temperature as high as 106.2° F.
7. Eyes were sunken.
8. Accumulation of fluid in lungs.

The rapidity with which the symptoms developed in these cows and the severity of the infection caused us to suspect hemorrhagic septicemia. The animals therefore received the standard treatment of bacterins and an internal treatment consisting of guaiacol, eucalyptus and camphor with aromatics; and counter-irritation over the lungs.

The increasing severity of the symptoms and the failure of these cases to respond to the usual treatment caused us to suspect pulmonary edema on December 10th and special bacterins containing protection against this infection were ordered.

The first case found in herd died on December 11th; a post-mortem examination was made and specimens taken and forwarded to two laboratories, one of which later reported finding the diptheroid or pleomorphic bacillus, usually associated with infectious pulmonary edema of cattle and hogs, and both reported finding hemorrhagic septicemia organisms.

The post-mortem findings were typical of hemorrhagic septicemia together with swelling of the lungs. The air sacks were filled with clotted blood and serum and the lungs resembled liver tissue in appearance. The trachea contained a heavy false membrane that resembled raw beefsteak in appearance.

Summary of Individual Cases

Case No. 1.—First noted to be ill December 9, 1928; temperature 106.2° F.

About three-fourths of lungs seemed affected on December 10th. Died December 11th, post-mortem examination made same day. Specimen were sent to two laboratories, one reporting diptheroid and hemorrhagic septicemia infection, other reporting only the latter.

Case No. 2.—Affected December 9, 1928; temperature 105.4° F.

Condition worse on December 10th.

Holding even December 11th.

Holding even December 12th. Consulted with Dr. Herbert Loethe of Waukesha, Wis.

Died on December 13th.

Case No. 3.—Taken sick December 9, 1928; temperature 104.6° F.

Distinctly worse on December 10th.

Worse on December 11th.

Died on December 12th.

Case No. 4.—Attacked December 11, 1928; temperature 106.4° F.

Distinctly worse on December 12th.

Died on December 13th.

Case No. 5.—Affected December 12, 1928; temperature 106° F.

Gave birth to a dead calf on December 10th and retained her placenta.

Received anti-hemorrhagic septicemia serum and regular bacterins.

No change December 13th.

December 14th, was given a dose special bacterins (containing protection against diptheroid infection) and 80cc Flavisol.

Died December 15th.

Case No. 6.—Taken sick December 14, 1928; temperature 106.6° F.

Given dose of regular bacterins in afternoon. Special bacterins arrived in evening and a dose was given at 9:30 P. M. with 200cc of anti-hemorrhagic septicemia serum. This cow was given a dose of special bacterins every 24 hours and from 200cc to 300cc of anti-hemorrhagic serum was given daily. In all 1500cc of serum was given. The temperature began to drop on December 19th and by December 22nd was normal. This cow now (Jan. 2) giving 70 lbs. of milk per day.

Case No. 7.—First ill December 15, 1928; temperature 106.6° F.

Given a dose of special bacterins December 14th. Stood in box stall beside Case No. 6.

Within 18 hours after the special bacterins were given to this cow she showed this high temperature. She was given a second dose of special bacterins at once and 100cc of serum. The temperature dropped to 103.6° F. in 24 hours and to normal within the next 24 hours.

Herd Treatment

The entire herd was given a dose of special bacterins on December 14th (a dose of 5cc), on December 18th (a dose of 6cc), and December 24th (a dose of 7cc). Calves under 400 lbs. were given doses of 2cc, 3cc and 4cc, according to the size. Some reaction in young calves was noted. They refused to eat in the evening following the injection but were ready for their milk in the morning.

Results of Standard Treatment

The results we secured in treating the first five cases with the usual treatment indicates that the medical treatment was of little, if any, value and that the standard bacterins used for uncomplicated hemorrhagic septicemia were of no value as a curative, and probably as a preventative agent against this disease when it is complicated with pulmonary edema. Had we been in a position to use the special bacterins with anti-hemorrhagic serum from the beginning, we would probably have been able to save cases Numbers 4 and 5.

Treatment of Sick Animals

Results secured in this herd indicates that in pulmonary edema if a dose of the diptheroid bacterins can be given together with a dose of from 100cc to 200cc of anti-hemorrhagic septicemia serum within a few hours after the first symptoms appear and is repeated in from 12 to 18 hours, and following that a dose of the special bacterins and the serum is given every 24 hours, that a large percentage of affected animals can be saved.

A Further Report on Pituitary Hormones

FOR his work in an investigation of the ductless glands and particularly in his isolation of pituitary hormones, Oliver Kamm, director of chemical research of Parke, Davis & Company, manufacturing chemists, has been awarded the $1,000 prize by the American Association for the Advancement of Science for the "most noteworthy contribution to science presented at the annual meeting."

The isolation of two hormones from the posterior lobe of the pituitary gland, as revealed by Doctor Kamm, is held by chemical scientists to be equal in importance to the isolation of insulin and the discovery of adrenalin.

Doctor Kamm isolated the alpha and beta hormones of the posterior pituitary after twelve years work in the Parke-Davis Research Laboratories. This, incidentally, is the first time that anyone has demonstrated that one gland might contain more than one hormone.

The alpha hormone is the so-called oxytocic principle. The beta hormone is the blood-pressure-raising principle. Doctor Kamm also showed definitely that the beta hormone has the power of controlling the excessive output of water. His paper before the American Association for the Advancement of Science showed that it has been a mistake to refer to the so-called "renal activity" of pituitary extracts.

The beta hormone does not act upon the kidneys, but controls the utilization of water by the individual tissues of the body.

The usefulness of this beta hormone is now under investigation in diseases characterized by excessive loss of water, such as diabetes insipidus, burns, cholera, other infectious diseases, and surgical shock.

Doctor Kamm points out in his prize-winning paper that much depends upon the ability of the body tissues to retain and utilize water. He said:

"The dangerous symptoms following surgical anesthesia are due mainly to the dehydration of tissues, and the use of beta hormone prevents such desiccation.

"Following extensive body burns, it has been thought that death results from the absorption of toxins. According to the newer view, however, it may be the result of the desiccation of the body tissues. In such cases, if this were proved true, the use of a drug like the beta hormone might possibly save life by favoring the retention of water in the tissues. It is conceivable that something quite startling might flow from this idea in cases of serious burns.

"Although other factors are also involved, it appears that proper hydration is needed for the growth of tissues. In this respect, few of us are absolutely normal. We find that some individuals are extremely sensitive to the action of the beta hormone—they are the 'physiological wets;' while others readily return to normal after administration of the hormone—they are the 'physiological drys.'

"It has just been observed that the fleshy type of individual is almost invariably of the wet type, whereas the slender, scrawny person is usually a dry. The suggestion is therefore made that we have here possibly one of the important explanations as to why the former is fleshy and why the latter fails to gain weight readily in spite of an excessive intake of food and water. It is apparent that the portly person who is desirous of reducing must cut down on his liquid intake, as well as on his intake of solid food. As for the scrawny person, gland therapy may possibly be indicated, but here the work still is in the investigative stage and conclusions cannot be drawn.

Practical Obstetrics

By EDWARD B. D. HALL, Kittering, England

MANY problems in obstetrics occur to an individual practitioner only occasionally. I offer the following suggestions in dealing with some of these problems. No originality is claimed but the methods have been found useful, and I have been able to give a comparatively accurate prognoses after the crises.

Cases with the calf out of reach, although distinctively felt through the flank and the fluids already evacuated, unless due to an extra-uterine gestation, are invariably cases of partial torsion, one horn of the uterus being turned over the other.

Treatment: Cast the cow by the Howard method as follows: Cow hitch round the body behind the elbows. The loop under the cow. Then with each end make a half hitch round each fore arm. Take the free end of each rope round the hind leg about the hock and bring back with a turn through the two ropes of the original hitch. Pull the cow down with the hind ropes above the hocks and then lower them to the heels and fasten including the fore feet. Cross the two ropes and rock the cow on her back.

The calf will soon come into reach and may be dealt with easily.

Calf on its back. This may be treated in the same way or the calf may be turned with a twitch stick, when the legs are pulled, by a winding movement.

Embryotomy. In amputation of limbs, the time honored method of skinning is the best method. The great point which has not been emphasized is to take off the limb opposite to the obstruction. Say a head turned to the right, take off the left leg.

Lumbar presentation. Pass the steel band round the calf's belly. Pull in a piece of ordinary binder wire with a loop at each end, cross the ends and saw the calf in half. This will take about five minutes. Loops can be made by lashing with a string.

Emphysematous calf. If presentation is normal apply a pulley to each limb; tie the cow by the horns or fore legs and pull out the calf by working first on one leg and then the other. This is the only case where brute force will be followed by a good result, since the gas in the calf is compressible.

Malpresentations. Resort at once to embryotomy.

Buttock presentation. In single calves, fix a westor purchase pulley to the hoof and the cow's hocks by a figure eight rope or two cow hitches above the hocks. Pull away. There is no need to cast the cow as she will roll over beautifully. (Mares, however, should be chloroformed and cast first.)

Raise the cow till the whole body is clear of the floor up to the shoulder. The calf can then be handled with ease. Lower the cow before pulling on the calf. This is also useful in treating other presentations. Particularly in a four-leg presentation, in which case the hind legs should be severed and the forelegs returned. Light pulleys are useful in revolving the calf *in utero* before lowering the cow.

Cows should be made to rise after a difficult calving if possible. A good method is one grain of strychnin hypodermically and then after a few minutes, seize the cow by the nose and shake the head. Where there is considerable relaxation of the vulva and vagina, the vulva should be sutured with a seton needle and a piece of doubled bandage, dressed with carbolized oil. Three stitches are sufficient. The sutures besides acting as a deterrent to excessive straining, act as a counter irritant and also prevent swelling through the scarification allowing drainage. Vulva clamps should be relegated to the museum.

Although to a novice suturing the vulva appears barbarous, the parts are relatively insensitive, and no restraint whatever is necessary.

The fact that the cow is unable to pump air in and out of the uterus materially alters the prognosis. The sutures will not prevent a cow from "cleaning." If the membranes protrude they should be cut off within

six inches of the vulva and not pulled. The sutures should be removed in 24 hours. Should the cow "clean" herself the first day, the prognosis is more favorable. If not, the afterbirth should be left for three days before any attempt is made to remove it.

There is nothing to be gained by delaying examination once the fetal membranes have ruptured and the fluids escaped. Should there be gross malpresentation and the os is not properly dilated, half an hour's rest, after correcting the presentation will be amply rewarded.

Sclerosis of the os. This may result in spontaneous rupture or may completely hold up the act of parturition. The best treatment is to rupture a sclerous os and not cut it. Some instrument which can be carefully and gradually opened should be introduced and opened till the os ruptures. There will be no hemorrhage and the cow will take no harm if the afterbirth comes reasonably early, although the peritoneal cavity will remain in communication with the vagina and uterus. An easy calving will follow.

Rupture of a sclerous os uteri is not dangerous. Tearing a healthy os, or uterine wall is decidedly serious and in spite of all efforts death often follows on the fourth day.

Tears of the vagina and vulva are relatively unimportant, and should an abscess appear in the pelvis about a month afterwards, it can easily be dealt with by an ordinary trocar and canula and a pint of Dieckerhoffe solution.

Flooding after calving. No attempt should be made to plug the vagina as this only induces straining. Apart from such products as adrenalin and piturtian, the physiological distribution of the blood can be made use of.

The cow should be milked. Given the breastings to drink or a bucket of gruel and moved about. The flooding will cease. Should the blood be the result of a wound and not true flooding, treat the wound if vaginal. Slaughter the cow, if uterine.

Collapse after calving or shock. A bottle of whiskey is the only remedy required.

Continued straining after calving due to no discoverable cause. This is nervous in origin and unless a drug of the morphin group proves effective, it will prove fatal. Nothing but the inflammation due to indrawn air will be found on postmortem examination. Tubing the cow is useless in these cases, sutures equally so; binders no use, truss only makes them strain more. Suturing the cocygeal folds together affords temporary relief but the cause is central and not peripheral. [What is the effect of Epidural Anesthesia in such cases?]

Atony of the uterus, partial paralysis, inertia, etc. These troubles are often due to a disease of the staggers type, now believed to be due to parathyroid deficiency, although tetany of the limbs may not be marked or may be entirely absent. The symptoms will appear in the eyes and the cow will devour forage and litter ravenously, scarcely pausing to chew it before swallowing. Strangely enough the uterus in general tetany is relaxed or paralyzed. One ounce of chloral hydrate and a few hours of patience is all that is necessary in many of these cases in the cow.

Bursting enlarged iliac glands in the act of parturition is invariably fatal in the long run. Secondary trouble appearing within ten days, often resulting in meningitis.

Imagination and knowledge are necessary to a successful obstetrician, but if there is any secret to the science, it is surely that one should train the left hand and remove the shirt.

Most of the more successful farmers in Central Michigan keep from 25 to 50 per cent more livestock than the less successful and, through a better grade of stock efficiently cared for, obtain a higher return per animal. In some cases they have more dairy cows, in others more hogs or sheep, or poultry—or a combination of two or more of these enterprises. These facts were determined by the Farm Management Section of the Michigan Agricultural Experiment Station after a careful analysis of the records of this year's business on 114 farms in Benton and Oneida townships, Eaton County, for the year 1927.

Physical and Physiological Activities of Cows*

1. *Per cent time standing and lying,* cows in barn, winter conditions. Averages for all breeds show that cows in the University dairy herd spent practically 50% time standing and 50% lying. Individual variations ran as high as 76% time spent standing to as low as 35%.

2. *Daily water consumption*—A three days' trial with 16 cows showed that cows in milk drank 4.38 pounds water for each pound milk given. The maximum daily amount was 233¾ for a Holstein producing 45 pounds milk daily. The minimum was 18 pounds for a dry Ayrshire.

3. *Amount urine and feces voided daily* —A three days' trial with 16 cows showed an average of 31.34 pounds of urine per cow, or at the rate of 26.8 pounds per 1,000 pounds live weight. The average amount of feces per cow was 69 pounds, or 59 pounds per 1,000 pounds live weight. The ratio of feces to urine was 2.2 to 1. This agrees substantially with findings at other stations.

4. *Number of urinations and defecations daily*—Observations of 23 cows for a one-day period and of 16 cows for a three-day period showed that cows in milk averaged somewhat higher in number of urinations and defecations daily. The number of urinations ranged from 2 to 15 inclusive; of defecations, from 10 to 24 inclusive.

5. *Time spent in eating and rumination* —Observations of a Jersey cow for a two-day period, and of two Holsteins and one Ayrshire for a one-day period showed that these cows (producing from 11 to 60 pounds pounds milk daily) spent an average of 5 hours and 57 minutes in eating, and 8 hours and 5 minutes in rumination.

The average time spent in rumination, or chewing individual cud, was 53.9 seconds. The average time spent in deglutition and regurgitation of cud was 3.73 seconds.

Observations of 22 cows in stanchions showed that they spent approximately three hours daily in eating and eight hours daily in ruminating.

Data were secured on the jaw movements of twenty cows while eating grain, silage, and hay, and while ruminating. The average jaw movements per cow while eating grain and silage were 94 per minute; while eating hay, 78; and while ruminating, 55. The total jaw movements per day approximated 41,000.

6. *Pulse and respiration rates*—Approximately 1,700 observations were made on 8 Ayrshires, 7 Guernseys, 15 Holsteins and 9 Jerseys of the University milking herd.

The average respiration rate per minute of Ayrshires was 28.6; of Guernseys, 18.6; of Holsteins, 28.6; and of Jerseys, 21.7. Marked variations from the average were noted in cows in normal condition, ranging from 11 to 64 per minute.

The average pulse rate per minute of Ayrshires was 69.6; of Guernseys, 59.8; of Holsteins, 68.6; and of Jerseys, 62.7. As in the case of respiration, marked minimum and maximum variations in pulse were noted, ranging from 38 to 96 times per minute.

The ratio of respiration to pulse ranged from 1:2.4 in Ayrshires and Holsteins to 1:2.8 for Jerseys and 1:3.2 for Guernseys.

(b) Observations of seven high producing cows kept in box stalls indicated appreciably higher pulse and respiration rates as compared with cows in the milking herd. The ratio of respiration to pulse ranged from 1:1.5 to 1:2.9.

(c) Two-hour observations of five high producing cows in box stalls for a one-day period beginning with 4:50 a. m. and ending at 9 p. m. showed appreciable variations in pulse and respiration.

* From Technical Bulletin No. 35, New Hampshire Agricultural Experiment Station by J. M. Fuller, Durham, N. H.

Practical Surgery*

Serviceable Antiseptic

Of course, we can hardly think of surgery without thinking of antiseptics. I find the following a very satisfactory, inexpensive antiseptic that can be made up right on the farm and is dependable. It is the Dakin-Carrol solution about which so much was heard during the war. It is made as follows:

Boric Acid.
Chlorinated Lime aaʒIss

Mix these powders and spread on cotton, placing in a funnel. Pour over it one gallon of hot water.

Castration of Pigs

Farmers frequently ask the veterinarian how they should proceed to castrate their own pigs. Where the farmer insists on performing this operation himself, the following directions should be given him:

1. Be clean.
2. Make a large incision.
3. Make the incision low down, not over the most prominent portion of the scrotum, but at the lower end of the testicle.
4. Cut the cord off high up. Do not leave it so that it can hang down into the wound.

Where the veterinarian is called upon to do this work he, of course, wants to perform a better operation. For this he may or may not use epidural (Benesch) anesthesia. In large animals it will be found a valuable aid in performing the operation and it is always a humane measure easily applied.

A fine operation, particularly for show animals where it is desirable that no visible scar should be left is to make the incision between the hind leg and the belly. Make it two inches deep and down to the cord. Pick up the cord with the fingers and pull the testicle into the incision and cut the cord with an emasculator or ligate near the internal inguinal ring, and then sever the tunic and remove the testicle. It is a real surgical operation.

The emasculatome is much lauded by some for castrating pigs. Owing to the very short cord in these animals, there is some difficulty in getting the instrument properly placed on the cord.

In the castration of colts the operation is improved by removing a portion of the median raphe from the scrotum. This keeps the wound open and affords good drainage.

Enucleation of the Eye

The surgical removal of the eye is an operation that veterinarians are frequently called upon to do in horses, cattle and dogs. The old operation for the removal of the eye was a very unsatisfactory one, and was followed by all sorts of undesirable sequelae. The new operation now largely used consists in first suturing the eye lids together. Of course, anesthesia must be used and where the operation is done under local anesthesia, it is advantageous to include adrenalin chlorid in the injections to prevent hemorrhage. After the eyelids are sutured together, an incision is made round both margins about one-quarter inch back from both margins through the skin and then going back under the lids the conjunctiva and the enclosed eyeball is removed. The cut edges of the lids are then sutured together and if the operation is carefully done healing will result by first intention and the animal will have a smooth face with little or no visible scar as a result of the operation.

Traumatic Pericarditis

There is an operation for traumatic pericarditis that while it doesn't offer very much hope in the ordinary case, it offers all the hope there is for saving the animal and is worth trying. Chloroform anesthesia is required. Operate on the left side, over the eighth or ninth rib, counted from behind. Make an incision through the skin right down on to the rib beginning with the junction of the rib with the costal cartilage and extending upwards for about eight inches. Then separate the muscle from the rib on

* Notes from an address on "Practical Surgery," by Dr. R. R. Dykstra, Manhattan, Kansas, at the 31st annual meeting of the Nebraska Veterinary Medical Association, Omaha, December 11-13, 1928.

both sides and also separate the parietal pleura from the under side of the rib. This can all be done by blunt dissection and with very little hemorrhage. The rib is next sawed in two at the upper margin of the incision, and by straining outward it is very easily broken off at its junction with the cartilage at the lower margin of the incision.

We are now ready to open the pleural cavity and as this will cause an immediate collapse of the lungs and considerable difficulty in breathing for a few minutes, it should be done carefully. Make first a very small incision through the pleura and after the breathing has come back to somewhere near normal for the anesthetized animal, incise the pleura for the full length of the incision in the skin.

The pericardial sac can now be opened either while the animal is under the anesthetic or it can be let come out from under the anesthetic and get upon its feet where the contents of the pericardial sac can be drained outside easier. If the foreign body is found in the sac and removed, there is a chance that the animal will recover. If it is imbedded in the walls of the heart, death will probably occur at once on removing it.

Hygroma of the Knee

Big knee in cattle, particularly in milk cows that are kept in stancheons is very common. Usually there is a large collection of fluid in these knees. In 90% of the cases, the fluid is subcutaneous and in the other 10%, it is in the tendon or articular sheaths. The operation here described is suitable only for the 90% of the cases in which the involvement is subcutaneous.

The operation should not be performed while the inflammation is active, but should be deferred until the acute processes have subsided. If the enlargement is 4 inches in diameter or less, the operation can be performed with the animal standing. Do not make the incision directly in front, where it will be injured if the animal lies down or gets up, but make it on the median side. The incision should be made four inches long, the cyst drained and the cavity packed with something to destroy the secreting membrane. Absorbent cotton saturated with a 5% zinc chlorid solution packed in the cyst for three hours is a serviceable dressing for these wounds. After removal of the zinc chlorid tampons, the wound should be treated as an open wound.

In cases of large hygromas, more careful surgery is required. These animals should be placed on an operating table, completely anesthetized and every possible precaution of aseptic surgery observed. After shaving the area, an incision through the skin should be made the same as for the smaller hygroma, but the cyst should not be opened. It should be carefully dissected out, particular care being observed in dissecting that portion next to the leg to make sure that the tendon sheaths are not opened. If by accident, the cyst is opened, and the fluid escapes, its removal will be facilitated by packing it snugly with cotton and proceeding as for the unopened cyst. Following the removal of the hygroma, the excess skin should be trimmed away and a large pack placed on the outside, bandaged snugly to hold the skin tight against the underlying tissue. Healing should occur by first intention.

Since this latter operation causes lots of hemorrhage, it is necessary to use a tourniquet. Infection must be avoided. The operation is a failure unless primary union at least of the skin to the underlying tissue is obtained.

TOXICITY OF TURKEY MULLEIN

Dr. L. M. Hurt, County Live Stock Inspector of the County of Los Angeles in California, calls my attention to a most interesting case of poisoning from turkey mullein *Eremocarpus setigerus*.

I have, on a great many different occasions in VETERINARY MEDICINE, called attention to the poisonous members of the Spurge family; namely, euphorbia, croton; and it is well known that the castor-oil bean is extremely toxic.

Dr. Z. H. Zink, County Veterinarian in charge of Field Work and Meat inspection, Los Angeles County Live Stock Department, has issued a most interesting and valuable circular on the toxicity of turkey mullein weed.—L. H. Pammel.

Local Medication

By J. W. PATTON, East Lansing, Michigan

THE veterinarian who has at his command the broadest knowledge of the administration of medicines, other things being equal, will be most successful in their use. Often it is not what medicine, important as this is, but how it is administered that determines success or failure.

It is of utmost importance to keep in mind the nature of the action desired, whether local or general; remembering also that local action is usually in inverse proportion to systemic action. Once a remedy has passed beneath the surface of the skin it becomes systemic, "general," in action; being carried by the blood and lymph streams to all organs of the body. Therefore in local conditions, unless very close to the skin the maximum effect is not obtained. Conversely, frequently, the most direct method of treatment, even in local conditions, is by systemic means. A combination of both methods is often desirable for utmost therapeutic effect.

Topical or local applications have been used by the laity from time immemorial. One of the earliest theories for local applications were presented on the basis of "humoral pathology," the drawing out of morbid fluids away from the diseased part into and through the skin. Irritants and counter-irritants are remnants of this theory of the darker ages of medicine. Cellular pathology and a better knowledge of the circulation made it quite evident that it is impossible to "draw out" disease by any such methods. Many of the laity still believe in the "drawing out" process, and frequently in their own treatment we see examples where irritants have been applied to raw surfaces in order to make them discharge freely.

Certainly irritants and counter-irritants have therapeutic value; however, the effects cannot be credited to any such theory as "humoral pathology." It has been shown that hyperemia of the surface is accompanied by hyperemia of the tissues for considerable depths and that this brings about reparative activity in the form of increased blood supply as well as through tissue disintegration products which have activity similar to nonspecific protein therapy.

In local applications to the skin it should be kept in mind whether epidermic "surface action," endermic "action on the derma," or diadermic "action after absorption" is desired. It should be remembered that it is possible for medicinal substances to be absorbed by the unbroken skin. Whether they are absorbed, or not, depends upon the nature of the substance to be absorbed, and the condition of the absorbing surface together with the method of application.

As one of the chief functions of the skin is protection, it is evident that a surface covered with dead keratinized cells and a fatty substance (sebum), presents a considerable resistance to the absorption of medicinal substances; especially to watery and nonvolatile agents, which are not normally absorbed by the unbroken skin. Watery solutions and nonvolatile substances may, however, be carried through the intact skin by means of the electric current. Watery solutions therefore are indicated for surface (epidermic) action. When vessels and nerve endings of the skin are to be affected, or when absorption (endermic and diadermic) action is desired, penetration through the fatty and horny structure is necessary. Penetration of medicinal agents may be facilitated by thorough preliminary cleansing with soap and water, alcohol, ether, etc. Friction, heat and occlusive dressings are other important aids. Incorporation in a fatty base (ointments) or the application of volatile substances, as in the case of liniments, facilitate penetration.

As dry skin is most impermeable it is necessary to bring about maceration, this softening of the epidermis increases the size of the interstices between the cells. A good example of maceration brought about by occlusive dressings is seen in the case of the hot poultice; such treatment presents a surface capable of absorption of even watery and nonvolatile substances.

When ointments are rubbed into the skin, maceration and absorption is facilitated by preventing the loss of sweat and by mixing with the fatty secretions of the sebaceous glands.

According to the depth of action on skin, medicinal substances may be classified:

1. Dusting powders.
2. Lotions.
3. Liniments.
4. Ointments.

Thus dusting powders on a dry skin are one of the least penetrating of medicinal substances.

Dusting powders differ considerably among themselves as to their hydrophil, or water absorbing power, in the following order; starch, Fuller's earth, talcum and chalk.

Simple dusting powders because of their water absorbing power are drying. This action is of antiseptic value as moisture is necessary for bacterial growth. Powders also afford protection from the air and to a certain extent from other objects.

Starch, talcum and chalk are examples of the former, whereas lycopodium and zinc stearate shed water.

Simple dusting powders often are medicated with astringent, antiseptic, anodyne or antipruritic agents. Boric acid is so mild that it may be used undiluted, or with varying proportions of simple dusting powders. Salicylic acid in 5% to 10% provides a powder of much greater antiseptic value, the addition of 10% of alum adds decided astringency. Iodoform and thymol iodid adds not only antiseptic but analgesic potency. Menthol 2%, in talcum, has considerable antipruritic value. On painful, raw surfaces 10% to 20% anesthesin added to boric acid has decided analgesic effect.

Powders, used on extensive raw and secreting surfaces, by drying with the wound secretions, may form a scab which retains the discharges and favors bacterial growth.

Starch, unmedicated with some antiseptic agent, is not desirable on discharging surfaces, in spite of its great absorbing power, because of its ready decomposition.

VACCINATION IN KANSAS

This is a subject that concerns the practitioner as well as the biologic producer.

I have noticed it for years, but thought that it would adjust itself, but it doesn't.

Many times we men in the sticks run across the stockmen using biologics that are advertised and supposed to be sold only to the "Graduate Veterinarian." They get these by different means. Sometimes from a veterinarian who is a bootlegger of biologics and no better than the common booze peddler. Sometimes from a biological house, which thinks it can sell to a stockman friend and get away with it. And sometimes through state institutions that push the business of selling and training farmers to use the syringe, and still expect the support of the graduate veterinarian.

I, for one, am fed up on any biologic that finds its way to the layman.

At this place, we are weak on not having a local organization to discuss such matters as this. It is simply up to the producer of bacterins and serums to know where his product goes. To my mind, the only method by which we can protect ourselves is by not using the same product the laity does. If we do not use a product of superior quality and do our work better, it is a surety we will lose out.

Yesterday I vaccinated a large herd of

cattle with a product supposed to be sold only to veterinarians, figured up my bill, and was informed by the stockman that my charges were out of reason and that he could procure the same product at 9c per dose from a serum plant which is owned by a graduate veterinarian, and sells his products to the farmer when he thinks he will not be found out.

Such instances as the above are embarrassing and surely is injurious to the veterinary profession. It is not likely that I will be called to vaccinate cattle for that farmer again. Why? Because he thought I would use a product and do the work better than he could. Now he knows he can get the same product that I have been using, and he will probably trust to some man with about six hours' training in the use of the syringe.

I think that biological houses should be informed when their products are found in the hands of the laymen, that they may have an opportunity to correct matters.

A Kansas Practitioner.

A TRIBUTE TO PROFESSOR KITT

Professor Theo. Kitt, reached the age of seventy years on Nov. 2, 1928, on which occasion he received many congratulations, and good wishes from his numerous colleagues and pupils throughout Germany and Europe.

Professor Kitt began his career as a practicing veterinarian in a little town of upper Bavaria, called Seefeld, in 1879. In 1886 he became Professor of General Pathology, Pathological Anatomy, Infectious Diseases, and History of Veterinary Science. This was the time in which the etiological investigations of infectious diseases by Pasteur and Koch were brought to their highest level. Ten years prior, Koch's first treatise about anthrax appeared. The new color technic with anilin colors on dried and fixed preparations had just been discovered. The cultivation of the tubercle bacillus, and infection of small animals with cultures was successful. This was the field in which Professor Kitt found to study as bacteriologist, and he built thereon.

Under Professor Kitt's leadership, the experimental station of Infectious Diseases, in Lenggries, a small insignificant institute, built for the investigation of different forms of anthrax was united with the institute for Pathological Anatomy in Munich. He succeeded in elevating this institute to such a high level, that its achievements are recognized throughout the world.

Professor Kitt's works are well known. His books on bacteriology, practical microscopy, pathological anatomy and general pathology, were for decades the only standard works on the subject in the scientific world. Kitt's special works include writings on pathological anatomy, histology, etiology, and prophylaxis of all infectious animal diseases.

He received many honors, among which, his appointment as honorary doctor of the Medical Faculty of Munich in 1897, honorary doctor of the Veterinary High School of Berlin in 1912, and honorary professor of the Technical High School in Munich in 1914, etc.

Chicago, Ill. Alex Eger.

NUMBER OF VETERINARY STUDENTS IN FRANCE

The number of students admitted to French Veterinary Schools during 1928 was as follows:

Veterinary School at Alfort.....49
Veterinary School at Lyon.....34
Veterinary School at Toulouse...39

Subjects of the written examination for admittance to French veterinary schools for 1928 was:

French composition: Comment upon and discuss this passage of Jean Jacques Rousseau "To work is the indispensable duty of social man, rich or poor, strong or weak; every idle citizen remains a rogue."

Natural Sciences—

Zoology: Physiologic properities of the muscles.

Botany: The structure of a leaf.

Physics: The solar spectrum.

Chemistry: The fatty substances.

Environmental Infections*

In handling infectious diseases, we rightly direct control measures to the animal that is infected, but we have recognized environmental infection because we have disinfected. There seems to be a tendency, however, to overlook the fact that in most diseases, environmental infection is of supreme importance. Few diseases are communicated directly from animal to animal.

In the case of anthrax, we know that infection in the soil, environmental infection, is of great importance. Most other diseases vary from anthrax in this nature only in degree. They vary only according to the longevity of the germ in the soil. In the case of tuberculosis, for example, we remove infected animals and disinfect the barn and haul out the manure from the barnyard and think we have finished; but in reality, every bit of soil inhabited by infected animals should be challenged and we should not forget that an old sow with open tuberculosis is just as dangerous as a cow with similar lesions.

An instance is recalled of a herd that for a number of years, contained no reactors. This herd was put on ground occupied by tuberculous swine and within a year, reactors were found. When slaughtered, they showed benign lesions and on typing organisms from these lesions they were found to have lost their virulence for experimental animals but they produced tuberculin reactions just the same.

In avian tuberculosis the great volume of infection is on the ground. We may test birds and remove infected birds till Gabriel blows his horn and will not eradicate tuberculosis from a flock.

Environmental infection, that is infection in the soil is like a bank account. So long as we make deposits, the account will show a balance. If we stop the deposits, nature's withdrawals in time will exhaust the virus account. It is known that young chickens do not contaminate their environment with tuberculosis infection, and we can very easily rid a farm of avian tuberculosis by preventing mature birds from depositing tuberculosis germs on it. It is only required that birds be disposed of as soon as they have passed their first laying and most profitable season. Do this religiously year after year, and in time all the tuberculosis infection will disappear from the ground.

This does not mean that the ground should be used continuously. For other reasons, it is necessary to use poultry runs for birds and for crops alternately, but if all chickens on a farm are disposed of year after year, as soon as they reach their first molting, the deposit of tuberculosis organisms on the ground will be stopped, and in the course of two or three years, possibly even four years (no one knows just how long tuberculosis organisms live in the ground) the farm will be free of avian tuberculosis.

It is understood, of course, that we cannot disinfect the soil, but nature can. In the case of some organisms as for example, anthrax, it may take a very long time, but with most diseases the death of organisms in the ground is relatively prompt, that is, it occurs in a year or so.

Abortion was formerly thought to be venereal diseases, and of course, no progress in its control could be made under such assumption because like most other diseases, it is in the main taken into the animal organisms with food and water. It should be remembered that fetal tissue is the chief host of the abortus organism. So far as the cow is concerned, an abortion is just a calf funeral. The uterus will ordinarily free itself from abortion infection within a short time after the fetus is removed. The critical link in the chain carrying abortion from one animal to another animal is the contaminated environment and the young animal if infected or born in infected surroundings, will soon free itself of infection. It is because of this that a barbed wire fence is often a bar to disaster from abortion.

* Notes from an address by Dr. L. Van Es, Nebraska Pathological Laboratories, Lincoln, at the 31st annual meeting of the Nebraska Veterinary Medical Association, Omaha, December 11-13, 1928.

PYLORIC STENOSIS IN THE DOG*

The following case is of interest in view of the few recorded cases of pyloric stenosis in the dog associated with a definite lesion in the region of the pylorus.

Subject.—A male French Bull Dog, two years old.

History.—From the age of eight months this dog had been subject to very frequent vomiting of all recently-ingested food. It was observed that its general condition remained good, that appetite was well marked, and that the vomiting did not distress the animal, whilst almost invariably it atttempted again to swallow the ejected material. No other symptoms of a gastritis had been observed, but latterly a slow but progressive loss of weight had been noted. The usual gastric sedatives had been given and very careful dieting instituted, including feeding with various peptonised foods.

Course.—At the time of examination, the dog appeared very bright and in fair general health, apart from a slight lack of flesh: the temperature was slightly subnormal, pulse normal. Appetite was very good, the animal appearing hungry at all times. A short time after food had been taken, the animal vomited the stomach contents. The vomiting was of a curiously regurgitant character, unaccompanied by any preliminary retching, and the material was mixed with a large quantity of glairy mucus. Bowel action was not marked, and the feces were of a very firm consistence. No tenderness of the abdomen was disclosed on palpation. Marked thirst was present. An examination of the gastric secretion showed it to be of a definite alkaline reaction. It was also observed that if small quantities of food were given and the dog kept very quiet for a period of one to two hours after feeding, the condition appeared to be under more control. It was also noted that periods of uneasiness or of actual mild pain occurred at intervals after the retention of food.

Having regard to the history of the case and the length of time the condition had persisted, together with the general condition of the dog, a diagnosis of a pyloric lesion, nature unknown, was made. This diagnosis was aided by the close resemblance of the vomiting exhibited to that so-called "projectile vomition" seen in infants affected with pyloric stenosis.

From the nature of the case, treatment was to be largely palliative. A mixture containing hydrochloric acid and pepsin was prescribed, feeding was instituted four times during the day and, above all, a period of complete rest for one and a half hours after each meal was advised. The diet consisted of small quantities of raw meat, fish, sweetbread, etc., and milk was allowed. No cereal foods of any description were permitted. These instructions were carried out with some degree of success, the condition of the animal improved somewhat, and it is of interest to note that some six weeks later the dog was successfully exhibited at the autumn L. K. A. show.

At the end of October a severe attack of vomiting was associated with extensive gastric hemorrhage, and the dog appeared to be in a moribund condition. Under treatment, however, it rallied, and its condition again improved for a short time. From this point, however, emaciation became marked, a steady loss of weight was recorded and intense thirst again developed. Destruction was advised and carried out.

Post-mortem.—The stomach itself was dilated. The mucous membrane of the left half showed congested areas and was covered with a large amount of adherent glairy mucus. The wall of the left half appeared in places to be thinner than normal. From a point commencing about one and half inches from the pyloric orifice, a great amount of thickening of the stomach wall was present and this thickening extended without break to the pylorus and was continued for about six inches of the duodenum. The pyloric orifice was greatly constricted and, on section, its wall was found to be some three times its normal thickness, and of a dense fibrous texture, the submucous and muscular portions being apparently converted into a fibrous connective tissue. Sections from the pyloric region sent for ex-

* Reprinted from the *Veterinary Record*, London, Vol. VI, No. 4.

amination showed a marked thickening of the circular muscle, with considerable infiltration of fibrous tissue. I am indebted to the Wellcome Physiological Laboratories for the pathological report.

Conclusions.—This condition is not commonly met with in the dog. Actual diagnostic symptoms are not definite, but a careful consideration of the history of the case, together with a weighing of the symptoms presented, are of value in forming a provisional diagnosis. Chief among these latter may be mentioned vomiting of a particularly regurgitant type always apparently invoked by the ingestion of food and unaccompanied by any preliminary retching; a change in the normal reaction of the gastric secretion, most probably due to degenerative change in the mucosa; the fair general condition of the animal for some months, together with a slow but steady loss in weight and the indication of slight abdominal pain or uneasiness following the retention of small quantities of food.—H. W. Dawes, M. R. C. V. S., West Bromich, England.

CONSTIPATION IN THE DOG

My experience in treating dogs and other small animals for different chronic diseases has led me to believe that constipation is responsible for a larger share of them than any other one cause; this being the case, it is the duty of the practicing veterinarian to seek to find out the factors that tend to produce constipation, of which I will mention a few.

The most prominent factor in the adult dog is the denial of nature's call to defecate, on the part of house dogs trained to habits of cleanliness. Lack of exercise usually operates in the same animals, as it also does in the chained watch dog.

Overfeeding contributes in various ways, by increasing the amount of fecal matter, by hastening the food through the stomach and small intestines imperfectly digested and therefore in a more irritating condition, and by contributing to obesity and lack of tone. In long-haired dogs, hair balls often accumulate to such an extent as to block the lower bowels. Lack of sufficient water and diseases of the liver will induce constipation. A too exclusive starchy diet and in puppies a milk diet will not only result in constipation but makes one of the best breeding places for worms.

Symptoms: The feces are passed in hard, fetid, whitish masses, often partly divided, in pellets, dry and polished on the surface and covered with a film of mucus, sometimes blood. They are passed at considerable intervals, slowly and with painful effort and straining.

In the more advanced and violent cases, defecation becomes absolutely impossible, though the animal strains violently and frequently. The anus is bulged out as a round swelling and sometimes there is hemorrhage of both anus and rectum. The anal glands are usually swollen and tender to the touch.

By manipulation of the abdomen between the two hands one can detect the inpacted gut extending forward for a considerable distance, and if extending to the cecum, vomiting is frequent. This is especially the case in puppies. Slight diarrhea may sometimes be present in severe constipation. This is due to the mass lying in a sac or pouch in the intestine, the firmer material gradually accumulating and the fluid feces passing over the collected mass.

If constipation continues uninterrupted till there is complete occlusion of the intestines, the animal sometimes is irritable and cross, and may show symptoms very similar to rabies. In fact in all of my observations of dogs suffering from rabies, I have never seen one that was not badly constipated. Long continued constipation may cause infection of the blood from absorption from fecal matter, hemorrhagic and diphtheritic enteritis, mortification, peritonitis, perforation of the intestinal wall, and death.

Treatment: In the milder cases plenty of out-door exercise and a laxative diet may succeed. In the more severe cases it is usually necessary to unload the rectum mechanically by using the oiled finger or a special spoon-shaped curette or obstetric forceps. After this procedure it is sometimes necessary to use the injection syringe

or pump. However, I seldom do this any more as I find it irritates the animal and by the rough handling of the instrument is liable to set up inflammation and even produce hemorrhoids. Therefore, unless too badly empacted, I am content with giving the proper cathartic, and repeat periodically until proper dieting has time to relieve the condition.

Cathartics Compared

In this connection I want to say something about laxatives and cathartics most commonly in use by the small animal practitioner. Probably the most commonly used one is castor oil. What does it do? It increases peristalsis and passes on through and leaves the patient in a worse constipated condition than it was before, and has to be repeated again and again. It has practically no action on the liver, of which the lack of secretion of bile is very often the cause of constipation. Sulphate of magnesia is frequently used for cathartic purposes and has about the same objections as castor oil, and should never be used as a cathartic in weak and emaciated puppies, as it drains the system of calcium of which the system is usually already deficient in.

I haven't for years used any of the above cathartics in my practice, and it seems that my success has been much better than when I did use them. Luck? Maybe; however, I don't wish to go back to the old way until I am thoroughly convinced that I am on the wrong track. For several years past and until a little over a year ago, I used Upjohns compound cathartic pills improved, and thought well of them and do yet as a cathartic. However, I find in the dog we not only need a cathartic but need an anthelmintic as well, as I will endeavor to show by citing a few cases.

Illustrative Cases

Case No. 1. A St. Bernard male, seven months old, which ate hearty, in fact had a ravenous appetite but kept lanky and didn't fatten up and suffered from constipation. I gave Upjohns compound cathartic pills periodically and they caused good movement of the bowels at the time, but soon had to be repeated, as he was soon as badly constipated as ever, and as I was convinced he had no round worms, decided I would find out what he did have.

I gave him two of my red worm tablets; the next morning he had a slight action of the bowels, but not enough to suit me. I then gave him three worm tablets and the next morning he had a little better action, but not yet enough to suit me. On the following day, at 5 P. M., I gave him five tablets. The next morning at 8 A. M. he had an action of the bowels and passed a tapeworm six feet long, head and all.

Case No. 2. Collie, two years old, came to the hospital with a history of being badly constipated. I gave him three of the red tablets in the evening about 5 o'clock and the next morning, I don't believe I ever saw so many round worms come from any dog at one time as came from him, and the surprise to me was the age of the dog, as I have been led to believe that after a dog was a year old, he is comparatively free from round worms.

Case No. 3. Setter dog, year and a half old, with a history that they had been giving him the usual cathartics, including castor oil, salts and the U. S. Comp. cathartic pills. I gave him two red tablets the first day, slight action on bowels, no worms; gave three red pills the second day. On the third had a good action and passed something like a handful of round worms, and was given no more physic and remained in the hospital ten days and passed a few round worms every day for six days.

These last two cases, 2 and 3, were brought to the hospital during July and August of this year, and the reason I mention them is to show that we can't be too sure a dog has no round worms after his puppyhood. Why I have ceased giving a cathartic that carries no anthelmintic is that I want to be sure of the fact that the patient has no worms; besides if the animal has no worms, these red tablets are as good a cathartic as Upjohns or any other pill and why should I take a chance of the animal having worms.

G. W. Browning.

Mobile, Ala.

STATE VETERINARY PROBLEMS IN NEBRASKA*

Nebraska experienced several outbreaks of glanders during 1928. Except for one outbreak of undetermined origin, the disease in each case was due to illicit importation of horses from South Dakota. The disease was eradicated in all cases and the state is now free from glanders.

There is a good deal of importation of both cattle and horses in violation of the state regulations. It is hoped that practicing veterinarians having knowledge of such importations will advise the State Department of Agriculture.

Johne's disease was discovered in five counties during the year. The extent of this disease in Nebraska is unknown; but it probably exists to some extent over a considerable part of the state. It is not believed that it is generally prevalent in any section.

Some difficulty is being experienced in handling bacillary white diarrhea in poultry. Many of the hatcheries are clamoring for state certification of freedom from this disease. The Department of Agriculture has adopted the policy of certifying flocks as free from this disease only when the blood samples are collected by a veterinarian, and the test made at the state laboratories or other laboratories satisfactory to the Department of Agriculture.

Unfortunately, a number of veterinarians are unaware of the importance of this matter and neglect it, and in some instances refuse to collect the blood samples or to have anything to do with it. It is urged that the practicing veterinarians cooperate with the Department of Agriculture and the poultry industry in this respect.

Infectious abortion in cattle is not so serious a handicap to the dairy and beef industry of Nebraska as it is to some other states. It is believed that in semi-range herds, the plan of separating the infected from the clean animals is a very practical one and that in a good many herds, if the young and the old animals are kept separate, that there will be little difficulty in getting a clean herd in a short time.

VETERINARY CONDITIONS IN NEBRASKA*

The past year has been the most satisfactory one ever enjoyed by the veterinary profession of Nebraska. The attendance at state and county veterinary meetings was better than ever before, and a large number of veterinarians in the state attended the A. V. M. A. meeting in Minneapolis.

The Veterinary Practice Act enacted by the state legislature earlier in the year is a great improvement on the veterinary law that we have worked under heretofore. It was necessary under the law, to appoint a new veterinary examining board, and the Governor called upon the state veterinary association for recommendations for this board, and the men recommended by the state veterinary association were appointed.

Nebraska is now fifth in live stock production and the value of its dairy products increased from $18,000,000 to $30,000,000 in the past five years. This has been reflected in increased practice.

CAESAREAN SECTION

If nothing else succeeds in cases of torsion of the uterus, of course caesarean section may be resorted to. It is an operation offering good chances for success if the circulation and other conditions of the cow is good; but if the cow is enfeebled and the calf is dead, one should explain that the operation offers little hope of success. The operation is, however, practically 100 per cent perfect where the calf is alive and the general condition of the cow is good. We prefer a caesarean section every time to a difficult embryotomy.

Make the incision for the caesarean section on the side with the gravid horn. The incision in the uterus will then be made on the greater curvature, where it should be.—T. H. Ferguson, Lake Geneva, Wis.

---

* Notes from the President's annual address by W. T. Spencer, Lincoln, Nebraska, at the 31st annual meeting of the Nebraska Veterinary Medical Association, Omaha, December 11-13, 1928.

Reviews and Abstracts

Diagnosis of Pelvic Fractures in Dogs

Carlin[1] in a report on pelvic fractures in dogs gives as the principal symptoms: locomotory derangements, local pain, crepitation, deformity and hemorrhages.

The division of injuries as done in horses into swinging and supporting leg lameness is not feasible in the dog. A typical position of the dog's hindlegs is present when there exists a fracture of the symphysis pubis; often an almost horizontal position of the hind extremities exists.

Examinations for the purpose of diagnosis are made as follows: The dog is placed upon a table while an assistant holds the head. The examinator then stands behind the dog and grasps around the abdomen or the upper parts of the thigh with both hands and presses simultaneously with the thumbs against the os ilium, coxae or ischial tuberosities. Pressure is to be applied evenly and not too strongly since if too much pain is caused by the examination and too much pressure exerted the reactions will not be accurate.

To make an accurate diagnosis by palpation alone is impossible. Crepitation is always present in pelvic fractures unless they are of old standing and the fractured ends have begun to decalcify. In that case crepitation is inaudible. Hemorrhage from the genital organs occurs only in rare instances and in many cases are of no importance. Internal hemorrhages are equally rare, if present the animals suffer from dyspnea and accelerated pulse rate.

Deformities according to the author are found mostly in the horizontal axis of the pelvis which becomes smaller. Deformities on the inner aspect of the pelvic orifice may be located often by rectal examination. They show generally as a decrease in the lumen of the pelvic foramen. This holds true also for infiltrations and for callus formations.

A good x-ray picture of the pelvis may be had by a photograph of either the lateral or dorsal aspect. The author prefers the latter since in that position he gets a complete picture of the pelvis; further all injuries are apt to show on a single plate. Very often the x-ray examination will reveal the most surprising findings. Clinical appearances often lead one to believe that the fracture is relatively simple and limited, still in many instances this is not the case since very often clinical symptoms will not tally with the extent of the pathological changes. The interpretation of the plates generally causes no trouble. In doubtful cases another picture from another angle will prove valuable.

Anamnesis in conjunction with careful local examination will render differential diagnosis generally easy. In contusions crepitation is not in existence and the abnormal movement and position of the extremities is absent. Sensitiveness over the region in question and lameness will disappear simultaneously. Luxations of the hipjoint are easily diagnosed by the pronounced shortening of the limb. Collum fractures will show an abnormal movement and a strong reaction to pressure just below the hipjoint. There will also be edema.

With regard to the prognosis the author claims that over 50% of the cases are curable. This is especially the case with young animals. The age of the animal is very important. Time of recovery varies from several days to several weeks, depending upon the lesions. Small hemorrhages disappear very soon without any interference during the first days of treatment.

The treatment should be directed towards absolute immobility and quietness. As a rule the dogs themselves will stay quiet. Should they persist in violent motions it is well to confine them in a small cage.

Plaster of paris bandages are contraindicated.

Diagnosis of Echinococcus Infestation

Although the postmortem lesions of echinococcus infestation are very characteristic and easily seen, the clinical symptoms

are very indefinite often even in aggravated cases. Cachexia and loss of condition, Robert[2] states are of uncertain value since the animal in good condition as to flesh sometimes conceals very grave infestation. Lesions in the liver may be discerned by palpation and percussion on the right side of the diaphragm in some cases, but all in all, a more reliable means of diagnosis than that furnished by physical examination is needed.

The fact that the toxins of the parasite plays an important role in its effect upon the host led to the search for a biological reaction that might be depended upon for the diagnosis. The existence of toxins in various parasites including the echinococcus has been proved definitely. (Mourson and Schlagdenhaufen, 1882. Laveran and Mesnil, 1899. Weinberg and Julien, 1911.)

It is important that we have a reliable diagnostic agent for echinococcus infestation since it is so common in both humans and animals, and with this end in view the author undertook researches into the cutaneous, intradermal, intrapalpebral and precipitation diagnostic reactions. The researches of Ithurrat (Argentine) indicate that only the sero-reaction can be depended upon for diagnosis. The method of Weinberg and Parvu is uncertain, in many cases as has been shown by the finding of hydatic cysts on autopsy of animals that had failed to react.

Thiellé reports 47% positive cases with cold serum, 40% positive cases by the slower method with warm serum and affirmed that no positive reaction occurred except in cases of echinococcus infestation.

Fleig and Lisbonne (1907) were the first to recognize a specific precipitin in the blood of humans affected with the disease and in the blood of cattle which had been infected artificially. But, their method has resulted in nothing but failures when applied to the bovine type of echinococcus. The question is: Will the antibodies respond only to the one kind of parasites, or will they respond as well to other pathological influences? The author, in applying the precepitation test used the liquid extract of *Cysticercus tenuicollis* as antigen and the results were unfavorable. Brochet's experience is in agreement with this for he reports that the precipitation test for domestic animals is very unsatisfactory with the echinococcus group.

The intradermal reaction was first applied successfully by Casoni in 1912. In his hands, this test was accurate in 87.5% of the cases. The Italian school has proved without doubt the diagnostic value of the cutaneous reaction. Absolutely clear cysts are selected for the preparation of the antigen. Their contents are mixed and several drops of phenol added. The technic is similar to that of the intradermal tuberculin test. The reaction if positive, will occur in a few minutes at the point of injection where an edema will occur with a slight irritation and edematous erythema. The general condition of the animal is not influenced; that is to say, there is no systemic reaction. Ithurrat of Buenos Aires claims the reaction to be perfect and above all doubts. Lemaire and Thiodet also have had fairly good results quite recently with this test.

[2] Diagnosis of Echinococci Infestation, by Capt. M. Robert, in *Revue Vétérinaire et Journal de Médicine Vétérinaire*, September, 1928. Abst. by H. J. Magens.

The Treatment of Trypanosomiasis in Horses

Several horses shipped to Garona (Africa) were found upon arrival to be affected with trypanosomiasis by Dauzats[3] and the diagnosis was confirmed by bacteriological examination. Upon suggestion of Janrot, chief of the medical mission to Camerun (Africa) for the prophylactic treatment of Sleeping sickness, the animals were given intravenously emetin-anilin in a solution of 1 to 50. The immediate reaction to the injection was very marked, the animals showed signs of the greatest anxiety and leaned heavily upon the assistant who was holding their heads. The dose given was 0.2 gram of emetin. The animals further exhibited locomotory trouble and incoordina-

[3] Equine Trypanosomiasis, by M. H. Dauzatis Garona Nord, Camerum, Africa, *in Revue Vétérinaire et Journal de Médicine Vétérinaire*, August 1928. Abst. by H. J. Magens.

tion, as if stricken with a paresis of the hindquarters.

Another animal after having been given 1.2 grams of this trypanocide at once threw itself violently upon the ground and exhibited all symptoms of a severe colic. This lasted about 15 minutes after which it could be led back to the stable. On the next morning the edema of the legs typical of trypanosomiasis had completely disappeared.

The treatment was repeated at intervals of three or four days. In the meantime varying doses of atoxyl were given intravenously or by hypodermic injection.

The animals responded to the treatment which, as a result of experience, was modified as follows: Emetin-anilin was given in a solution of 1 to 100 and atoxyl was given in conjunction with it. Many animals were treated thus at Garona, Logone, Birni and N'Gaoundlié. Of seventeen recognized trypanosoma carriers fifteen recovered; two died.

Treatment of Rickets with Vigantol

Van den Eeckhout[4] in a review of the literature on rickets states that the role of vitamin D is all-important. It is formed in the body by the exposure of the skin to ultra-violet rays, either those of the lamp or the sun rays. It is contained as well in the non-saponified portion of the codfish liver. It may be obtained also by radiating with the ultra-violet rays cholesterin or certain fats. It used to be made under the trade name "Osteline" in a suspension of the non-saponified portions of the codliver in glycerine.

Very early the rickets preventive and curative value of the vitamin D was recognized and commercially prepared by the I. G. Farbenindustries at Leverkusen, Germany, under the trade name "Vigantol."

In 1925 and 1926, Hess, Steenbock, Weinstock, Helmann, Black and Webster proved that this vitamin was derived through the influence of the ultra-violet rays upon cholesterin. They discovered as well that lipoids in food exposed to ultra-violet rays take on anti-rachitic properties. They introduced a special product, the provitamin which exposed to the rays will form vitamin D. This provitamin does not saponify and belongs to the stearin group, it is present in all animal bodies and may be activated by exposure of the animal to ultra-violet during life. The sebum of the glandular parts of the skin—and the lanolin belong to the cholesterin group.

In their experiments Hess and Weinstock, Steenbock and Black obtained the vitamin D from radiating cholesterin but after completed exposure 99% of the radiated cholesterin proved to be inactive. Windaus subsequently proved then this is due to the fact that another stearin was contained within the cholesterin and that this was the only part that acquired anti-rachitic properties as a result of radiation. The positive results obtained with this stearin called ergosterin definitely proved Windaus contentions. The product obtained from the ergosterin by irridation is fairly stable unless exposed to the influences of oxidation. It is too early to give a positive opinion as to the value of the new preparation but the clinical results have been little short of marvelous.

Pulmonary Lesions in Aborted Foals

According to E. Neefs[5] in 1926 and 1927 a number of mares purchased by the Belgian army in the earlier part of the gestation period aborted. The bacteriological examination proved negative as to contagious abortion of mares. The postmortem examination of the fetus revealed several incarcerated cheesy lesions and foci throughout the lungs. Several other fetuses were autopsied and the same pulmonary lesions were found.

The lesions in the lungs resembled very much those of the pseudo-tuberculosis of the guinea-pig. Nodules were found from the size of a lentil to pinpoints, purulent in character, white to dirty yellow, often caseous material was contained. The organism isolated was Gram positive and easily stained by the ordinary staining methods. It lives for many months. The organism

[4] Treatment of Rickets with Vigantol, by Van den Eeckhout, in *Annales de Médicine Vétérinaire*, Vol. 73, No. 10. Abst. by H. J. Magens.

[5] Pulmonary Lesions in Aborted Foals, by E. Neefs in *Annales de Médicine Vétérinaire*, Vol. 73, No. 5. Abst. by H. J. Magens.

had no effect whatever upon laboratory animals into which it was injected. Even mares did not show any effects while pregnant. The agglutination was negative. The author is at a loss with regard to his findings, since neither the B. Preiss-Nocquard nor B. Koch were found; he advances a theory of an infection, polyarthritic in character which, if it could be proved to be correct, would necessitate the revision of the theory of umbilical infection.

Control of Grubs in Cattle

Very good results have been obtained in Holland with a preparation containing 10% of paradichlorobenzen in vaseline according to E. Leynen[6]. In Denmark very good results were obtained by strictly enforcing an inspection law with strict individual local treatment of the animals by local inspectors. In 1922 Jutland showed 24% of the hides perforated, in 1923 18%, in 1924 the percentage of perforated hides dropped to 4.5% for the whole country. Powder of *Derris elliptica,* an Indian plant, was also recommended.

Food Inspection

Neseni[7] records some interesting experiences in an article on Inspection and Control of Food. In small towns this work should be entrusted to the local practicing veterinarians, since these small towns cannot very well afford to pay the salary for a whole-time qualified man for that work. The local veterinarian therefore due to his training and experience, his knowledge of animal diseases, of management and care of the animals and of public health and hygiene is the proper person to employ for the enforcement of these sanitary codes.

In 985 cases chemical tests of sausages and hamburger meat was resorted to and resulted in the finding of coloring agents; in 130 cases flour had been added to the sausage and not declared on the label. This finding was regarded very satisfactory since the product in question is very cheap and it is hardly possible to produce it without the addition of some cereal. From the standpoint of the veterinary inspector the hamburger meat offers the greatest difficulty since if treated chemically it will retain its good color and appearance even though spoiled and unfit for use.

Milk samples to the number of 362 were examined and no condemnations made because of foreign substances in the milk or cream or due to chemical preservatives added thereto. It is interesting to note that most emphasis was laid upon sanitation and hygiene with regard to the finished product. On the basis of his experience the author holds that the bacteriological examination of milk is from the standpoint of the public health worker the most important.

With regard to butter the author makes the interesting statement that in very many instances it was found to be adulterated by the addition of margarin or oleomargarine.

Cheese of various types, vegetable oils, etc., lard, honey, etc., all came under the scope of this inspection.

Effect of Sunlight and Temperature on the Longevity of Foot-and-Mouth Disease Virus

The virus of foot and mouth disease outside of the animal body is directly influenced by humidity and the intensity of the sunrays, according to Svoboda[8]. The hygroscopic properties of the substrata upon which the virus is resting at the time protect it from complete desiccation and consequent extermination. Experimental desiccation upon straw progressed very slowly during the winter and fall. Upon this base, straw, the virulence was unimpaired for 40 days. During March with increased temperature and intensity of the sunlight increased no marked change in virulence was noted. In

[6] Treatment of Hyperdermosis of Cattle, by E. Leynen, in *Annales de Médicine Vétérinaire,* Vol. 73, No. 5. Abst. by H. J. Magens.

[7] Inspection and Control of Food, by Raimund Neseni, in *Prager Archiv für Tiermedizin und Vergleichende Pathologie,* Vol. VII, No. 3. Abst. by H. J. Magens.

[8] The Influence of Atmospheric Factors on the Longevity of Foot-and-Mouth Disease Virus, by Svoboda in *Prager Archiv für Tiermedizin und Vergleichende Pathologie,* Vol. VII, No. 3. Abst. by H. J. Magens.

April, however, a rapid decrease of virulence was noticed with straw as substratum. Within eight days under April conditions the virulence had ceased altogether.

Importance of Meat Inspection in Disease Control

In a paper read before the society for the advancement of animal traffic Messner[9] points to the advantages of meat inspection if carried on in a highly efficient and scientific manner. The inspection service is called upon to save for the producer losses which are not justified. Although there is no general law in the republic (Czecho-Slovakia) to insure uniform inspection the producers lose yearly three and one-quarter million pounds of meat condemned on the opinion of the individual and often differing opinion of the various local inspectors. If a general meat inspection law was instituted the farmers could by comparative study in some measure eliminate the diseases that cause the condemnations and so help their herds from standpoint of producer and consumer alike.

Illustrations are cited that bear out the author's statements. For instance the catastrophic outbreak of liver flukes in southern Bohemia was foretold for some time by the findings of meat inspection. The same is true for the enormous losses from lungworms in sheep, cattle and swine, of trichinae in cattle and hogs, etc.

In this connection tuberculosis must not be forgotten. With regard to the latter disease every farmer who thinks ought to ask himself the following questions: Have I tuberculosis on my place? Are the cases already advanced ones? Are they cases which are infectious? Are they cases dangerous either for my own family or for the personnel working on my premises? If every farmer would ask himself these important questions then the way would be paved for the most important work ahead, that is, the eradication of tuberculosis.

[9] Correlation of Production of and Demand for Animal Food Products, by H. Messner, in *Prager Archiv für Tiermedizin und Vergleichende Pathologie*, Vol. VIII, No. 1. Abst. by H. J. Magens.

Etiology of Chronic Coryza of Pigeons

Saint Moulin[10] describes his lack of success with autogenous vaccines in coryza of pigeons. After having studied for several months the bacterial flora of pharyngeal and laryngeal regions of pigeons, he propounds three questions. Is the coryza of pigeons of diphtheritic origin? Is the coryza of pigeons due to the ordinary pyogenic bacteria commonly found within the nasal fossae of pigeons? Or is the coryza of pigeons connected with intestinal parasites? With regard to the first the author's experiments show that vaccinations against diphtheria (Method of Lahaye) is of no benefit either as a treatment or as a preventive. He therefore concludes that the answer to his first question is negative. As to the second question the author claims that the bacterial flora even of the two nostrils of one bird is different, that birds out of the same flock will show very different bacterial cultures and that birds inoculated with infected mucous of sick birds will not become sick unless they are affected with intestinal parasitism. As to the last question: There is one important factor with regard to the appearance of all birds sick with coryza of pigeons that is their state of undernourishment and malnutrition. During May and June in the affected flocks young birds frequently die of coccidiosis.

Also pigeons affected with coryza always suffer from enteritis. This often rather mild form of enteritis frequently passes unnoticed; on other occasions it may be very severe. Anamnesis usually reveals that the flocks affected suffered from coccidiosis for several years and microscopical fecal examinations always reveal tapeworms and round worms. In most cases coccidiosis is present.

If one therefore subjects the birds affected with coryza to a careful antiparasitic medication and prevents them from eating, drinking and walking in their own droppings in order to prevent reinfestation, the birds will get better in just the time it takes to subdue the particular kind of parasitism encountered. Local treatment is uncalled for.

[10] Etiology of Chronic Coryza of Pigeons, by DeSaint Moulin in *Annales de Médicine Vétérinarie*, Vol. 73, No. 3. Abst. by H. J. Magens.

These statements are based upon findings in more than 1,500 pigeons. The author comes to the following conclusions:

Coryza of pigeons is not a variety of some diphtheritic infection; nor is it due to the pyogenic bacteria commonly found in the upper air passages of pigeons. It seems to be closely related to parasitism of the intestine and to coccidiosis. Birds affected should be given antiparasitic treatment and their habitats disinfected thoroughly.

4,214 Cases of Laryngismus Paralyticus

Fowler[11] has kept a record on 4,214 cases operated upon for roaring during the past twenty-five years. The reasons for the appearance of this ailment are to be found in shipping fever, influenza, pneumonia or other disorders of the respiratory tract. In most cases the left side of the larnyx is involved due to the fact that the left motory nerve supplying the larnyx is pinched due to over-expansion of some glands related to the lungs because of enormously increased pulse rate during these diseases. Due to this fact all nerve impulses to the muscles of the larynx cease and the muscles for lack of nourishment become inactive resulting in "roaring." The course of the right nerve is different as well as its origin which accounts for the rare occurrence of the paresis on the right side of the larnyx. Excluding "roarers" from breeding according to the author is uncalled for since the condition is not heritable.

Action of Aloes Isticin and Calomel

The intestines according to Bruno[12] must be regarded as an organ of resorption as well as of elimination. In the case of aloes the secretion of the gall is the all important factor in making the aloes effective, that is it changes the drug from an inactive one into an active one.

Several authors report fatal cases where animals, (horses or mules) have been given repeated doses of aloes within twelve hours after the initial dose of from 30 to 40 grains.

Postmortem examination of these cases revealed a severe gastro enteritis and the typical odor of the aloes in the fecal matter. Trembling, fever, extreme thirst, general weakness and marked diarrhea was noted in typical cases of aloes poisoning. (Loer, Fröhner, Jensen, Zimmerman, etc.)

Isticin, chemically a dioxyanthrachinon, has no toxic effects. Frequent mention though is made in the technical literature of the toxic effects of calomel. Fröhner and Gerlach report it to be fatal to cattle even in very small doses. Sheep as well as goats can tolerate but very small doses. Combined medication of calomel and aloes in horses is said to be especially dangerous. The drug will cause at once all symptoms of mercurial poisoning such as drooling, ulcerative stomatitis, sever gastritis, coughing, exanthema, paralytic conditions, nephritis, and hemorrhages in several organs. According to Poulsen.

Regenbogen cites a case where 42 horses were given either one or a half a bolus of the following combination Extr. Aloes 20 grams, Calomel 3 grams, oil of anise and soap q.s. The same afternoon or the following day the animals became very ill. They showed entire loss of appetite, watery diarrhea, colicky pains, and became very weak. Several animals died.

The author comes to the conclusion that with regard to both drugs aloes as well as calomel, certain precautions should always be observed, i.e. guarding against colds, absolute rest, also the doses have to be carefully figured and the indications absolutely watched.

Nutrition, Production and Sterility of the Dairy Cow

Production of dairy cattle depends upon their individuality, nutrition, method of keeping and feeding. Lenhartz[13] recommends ruthless culling of non-producers, but

[11] Roaring from the Viewpoint of the Breeder, by W. J. R. Fowler, in *La Revue des Eleveurs*, Vol. III, No. 3. Abst. by H. J. Magens.

[12] Clinical Observations with Regard to Laxative Action of Extract of Aloes, Isticin and Calomel in Horses, by Bruno Loewel, in *Tierärztliche Rundschau*, No. 27. Abst. by H. J. Magens.

[13] Nutrition Production and Sterility of the Dairy Cow, by Muller and Lenhartz, in *Berliner Tierärztliche Wochenschrift*, Vol. 44, No. 21. Abst. by H. J. Magens.

only after careful technically supervised feeding experiments have shown that the animal is incapable of increase in production by feeding. In raising calves care has to be taken that the feed contains sufficient vitamins soluble in fats (Codliver oil).

It has been experimentally established that calves fed on skimmilk and codliver oil have shown much better development in winter than calves fed upon whole milk. In the Northern countries this method of feeding is used very much and with very good results. Beginning with the second week the calf ought to be started on good fine hay. Later on the animals are to receive beets, carrots, etc. (vitamin C). Advisable additions to the ration are also a little flaxseed mealcake as well as crushed oats. It will prove advantageous for the development of the animals if there is added to this feed a mixture of salts containing phosphoric acid, iron, copper and iodin in small quantities. Good pasturage is very essential for the young.

No breeding should take place before the animal has reached 30 months of age. During pregnancy attention has to be given to the feeding of sufficient minerals and vitamins. The animal needs reserves for the lactation period. Intensive feeding of proteins will cause weakening of the sexual functions and so will cause a shortening in the time the cow gives milk. This has been observed in several northern testing clubs. Observations in Finnland have shown that a rather weak addition of iodin to the ration will tend to lessen sterility.

Electrical Anesthesia of Slaughter Cattle

Wendt[14] made experiments with electrical anesthesia in the municipal abattoir of Stuttgart. He used a direct current of 110 to 120 volts and only from 1 to 2 amps. Two insulated wires with a copper plate and switch were used which were placed upon the loins previously moistened by water, the other electrode was a brass tube placed into the mouth of the animal similar to a bit. The animals went down very quickly when the current was turned on but without the customary shock when hitting the ground. There was the absolute unconsciousness of the animals involved. Consciousness returned, however, after several minutes only to disappear again after the current was again turned on. The method has been successfully used in Holland in Utrecht.

Comparison of Cow's Milk and Goat's Milk for Infant Feeding

As a nutritive agent suitable for the infant Petit de Langle[15] discards at once pasteurized and raw cow's milk, holding the only milk to be had in marketable quantities that is suitable for this purpose is goat's milk. He claims pasteurized milk to be a sterile product having lost many essential physiological properties. Its acid reaction, its leathery composition, etc., render it, no matter how treated, unsuitable for use of the infant. Interesting is the statement that there possibly cannot be any competition between cow's and goat's milk since they have two entirely distinct missions.

With regard to the cream of the goat milk it must be said that the fat globules are one-fourth the size of those of cow's milk, that the thickness of the enveloping capsule of the globule is also one-fourth of that of capsule of cow's milk. The digestibility of goat's milk is surpassed only by that of the human female. It is proved that the gastric juice will dissolve these capsules in the case of goat's milk within 20 minutes while it will take two hours for the cow's milk. Although the percentage of the casein is nearly alike still the construction of the molecules (small size) in goat's milk, make their digestion much easier. Another advantage is the fact of its being nearly as alkaline as human milk. Goat milk contains more albumin, more phosphates and calcium salts than cow's milk according to this author.

---

[14] Electrical Anesthesia of Slaughter Cattle, by Koesler, in *Zeitschrift für Fleisch und Milkhygiene*, Vol. 38, No. 16. Abst. by H. J. Magens.

[15] Comparative Analysis of the Milk of the Female Goat and of the Cow, by Petit de Langle, in *La Revue des Eleveurs*, Vol. II, No. 11. Abst. by H. J. Magens.

Localized Lesions of Tuberculosis

Thirion[16] reports finding a lesion of tuberculosis about the size of a nut on the body of the ninth dorsal vertebra. It was distinctly separated from the surrounding tissues and contained a caseous mass out of which grew approximately one-half dozen nodules of a darker color. Upon incision they showed a typical calcified caseous tubercular lesion.

Several other lesions were found although some of them were not yet calcified but more of a liquid stage.

Out of the ganglions several fine and granular bacilli were isolated; a guinea pig injected with these bacteria from the spineous processes was killed two months later and showed classical tuberculous lesions.

This publication has for its purpose the report of a case of tuberculosis of the spine, which has been very rare in veterinary practice and emphasizes the necessity of inspection of the bony parts of the carcass in doing meat inspection.

Balance of Acid and Alkalis in True Rickets of Animals

After numerous experiments, physicochemical in nature, Liégeois[17] comes to the conclusion that the old view that rickets often is nothing but a type of an acidosis, is in a measure justified. The existence of an acidosis, in infantile rickets has been established by Blum, Dalaville and van Caulaert. The authors find that in these persons the drop in the alkaline reserve varies between 39 and 46 volumes, whereas the normal figure for the infant ranges between 52 to 56 volumes. Leenhardt Chaptal found the same in four cases out of seven, they emphasize that in all cases excessive amounts of ammonia were present. The author used in his experiments young dogs, shotes and chickens with established rachitic tendencies and had them verified in two instances by histological examinations. Conditions under which figures and blood samples were obtained tallied exactly.

Liénaux and Huynen in their classic on rickets and ostemalacia come to the conclusion that the two conditions are only types of acidoses. Hébrant and Antoine came to very similar conclusions.

The author reviews the effects of cod liver oil and vigantol. Their therapeutic influences are based exactly upon this equilibrium between acids and alkalis in the blood.

A Superior Anthelmintic for Dogs[18]

Pyrethrines, the active principles of pyrethrium *Chrysanthemum cineraraefolium* are not toxic for warm-blooded animals; their toxicity to cold-blooded animals is considerable, and increases as the scale of development becomes lower. Leeches and lombrics die in solutions of 1:1,000,000. Worms, insects and larvae are still more susceptible. Death is caused by paralysis of the nerve centers, preceded by convulsions.

Having observed the harmlessness of the pyrethrines when given orally to dogs, and to other warmblooded animals, M. Chevalier decided to administer them for their therapeutic effect as anthelmintics. Experiments made on taenias from dogs and ascarids from hogs, proved that as soon as they come in contact with a diluted solution of pyrethrin they show violent movements, then they became paralyzed and died.

In numerous cases of worms, he observed expulsion in an inert (paralyzed) condition, a few hours after ingestion of pyrethrin, either in form of pills or emulsion. Even in young dogs this method of treatment has never caused any disturbance to the health of the animal.

On account of its complete harmlessness to the host, combined with the marked vermicidal action on the different intestinal parasites, it is to be preferred greatly to the anthelmintics now generally used.

---

[16] Bovine Tuberculosis with Bony Localizations, by Thiron, in *Recueil De Médicine Vétérinaire.* Abst. by H. J. Magens.

[17] Balance of Acids and Alkalis in True Rickets of Animals, by F. Liegeois, in *Annales de Médicine Vétérinaire.* Abst. by H. J. Magens.

[18] A New Anthelmintic: Pyrethrium Insecticide, by M. J. Chevalier, from Revue Veterinare, November, 1928, page 619. Abst. by C. H. Schultz.

Success Crowns Efforts of Distemper Research Committee

The work of the Distemper Research Committee of the Medical Research Council of Great Britain has received such frequent mention in these pages that our readers are, of course, familiar with the fact that the subject of canine distemper has been under investigation by this committee for a period of more than five years, and that the committee has developed a highly effective means of immunizing dogs to canine distemper.

In a recent report made by the Research Committee to the Medical Research Council and the "Field" Distemper Council, the methods of preparing the immunizing agents were given in greater detail than heretofore. This report is published in full in *The Field* for November 29, 1928, and occupies a number of pages of newspaper size. Much of the following is taken verbatim from this report.

Readers are aware that this distemper investigation was made possible because of a very large fund collected for this purpose by *The Field*, a leading sports publication of London. Subscriptions to this fund from the dog owners and veterinarians in America totaled a large amount. The work was carried on under the Medical Research Council, which supplied the grounds, the laboratory facilities and two investigators, Dr. P. P. Laidlaw, F. R. S., and Major G. W. Dunkin, M. R. C. V. S. The fund collected by *The Field* was administered by the "Field" Distemper Council and was used to provide the extensive buildings, the attendants and operating expenses.

Illustrations of these buildings at the Medical Research Council's Farm Laboratories, Mill Hill, near London, and a description of the way the work was carried on, together with a report of an interview with Major Dunkin was given in our May 1927 issue by Dr. J. G. Horning of Houston, Texas.

The Distemper Research Committee has made seven reports of progress heretofore, all of which have been discussed in these pages. The reason given for the summary of the work done to date at this time is stated by the committee to be because: "The investigations have reached a point where the knowledge acquired is capable of being usefully applied in practice to rendering dogs resistant to infection by distemper. This has been demonstrated beyond peradventure by experiments at the Farm Laboratories during the year, and trials made with sporting and other dogs under ordinary conditions have so far supported the conclusions of the laboratory experiments."

The Method of Immunization

The method consists of a double inoculation. The first inoculation is made with a vaccine which is in fact the inactivated virus of distemper. The second is made, after an interval of about ten days, with an attenuated strain of living virus. The dose of living virus is a hundredfold that which would infect a dog not previously treated with the vaccine, but as a rule it is followed by nothing more than a trivial and transient disturbance of health; often no departure from the normal can be detected. Dogs which have undergone this double inoculation have proved to be completely resistant to the disease thereafter, whether exposed to infection by being placed in close contact with animals suffering from the disease or by the administration of infective material.

In accordance with customary scientific practice, the investigators have published details of their results, stage by stage, in a series of papers. It is therefore open to commercial firms to develop the production of the vaccine with a view to placing it on the market, while the absence of any monopoly should safeguard the public in respect of the price charged.

Manufacture of Vaccine

Dogs suffering from acute distemper are killed by an overdose of chloroform; the carcass dipped in a 2 per cent lysol solution and pinned out. The spleens are removed with sterile instruments, using

strict aseptic precautions; weighed and rubbed up in a sterile mortar, into a smooth mass as quickly as possible. Sufficient saline is added to yield a 20 per cent suspension of spleen pulp, and after brief stirring the contents of the mortar are transferred to a sterile bottle containing glass beads. The bottle is shaken vigorously in a machine until all the fragments seem to be broken up. The contents of the bottle are then filtered through a double thickness of sterile muslin into a sterile bottle. All tissue shreds are thus removed and discarded. A small quantity of the filtrate is removed for a potency test. Sufficient strong formaldehyd solution is added to the main bulk to yield a final concentration of 0.1 per cent, after which the mixture is shaken and transferred to the refrigerator. After four days, the formolized spleen suspension is invariably non-infective and sterility tests are made both for aerobic and anaerobic bacteria. If the product proves to be sterile, as is usually the case, it may be used as a vaccine without any further treatment. Owing to the presence of a small amount of formaldehyd, however, vaccines of this kind are irritant when injected subcutaneously. A non-irritant product can be made by adding sufficient ammonia solution to give a faintly alkaline reaction. In practice, ammonia is added until a reaction of pH 8.0 to pH 8.2 is secured, and thus all free formaldehyd is converted into urotropin and the final product is devoid of irritant properties.

For the potency test, referred to above, the 20 per cent suspension of spleen pulp is diluted freely and doses corresponding to 1/10,000 gm. and 1/100,000 gm. of spleen are injected into two animals. Both animals should sicken with distemper promptly. If they do not do so, it is clear that the virus content of the material which was converted into vaccine was low and the resultant vaccine will probably prove to be inferior. Owing to the incubation period of distemper, it is necessary to assume that the material will yield a good vaccine and finish the preparation of the vaccine at one sitting. It is not advisable to keep the spleens whilst the potency of these organs is being determined, as during the wait of several days considerable deterioration will occur in the virus content of the tissue.

Experience of upwards of forty different batches of vaccine prepared in this way shows conclusively that it is not difficult to secure a product which is fairly uniform and usually quite efficient, while if due care be taken and the concentration of formaldehyd recommended be employed there should be no difficulty in securing a sterile product.

The vaccine made by the method described has been shown to keep for some months without serious deterioration, and it was found that organs other than spleens might yield vaccines with similar properties. On the whole, however, the spleen gave the best and the most uniform product.

It was found that abdominal lymph glands, spleen, liver and brain might all be made into efficient vaccines on some occasion and not at others. A review of the successes and the failures indicated that the first prerequisite for the manufacture of good vaccine is a rich supply of virus in the organs from which it is made. When the virus content of the tissues selected from the distemper dog was shown to be high (minute doses proving infective for ferrets) the vaccine proved to be efficient. When the virus content of the tissue was low the vaccine made from it usually proved to be inferior.

For example, the brain in the average case of distemper does not contain much virus and if it is employed for the manufacture of vaccine the resultant product is worthless. The brain in the acute nerve type of distemper sometimes has a high virus content, and can be then converted into good vaccine by the ordinary method. The abdominal lymph glands and spleen gave almost uniformly good results when the tissues were collected between the seventh and eight-

eenth days following infection. Spleens collected at the height of the first febrile reaction did not give such good results. The livers are variable, but with this organ again, it was found that if it contained much virus the vaccine made from it was usually of good quality, and if the liver did not contain much virus, the resultant vaccine proved to be inferior.

It does not seem possible to choose an optimum time for the collection of these tissues, as the difference in response in different dogs is so great, but it is clearly advisable only to collect tissues from dogs which are hard hit by the disease and preferably at the time when they appear to be at their worst. Experience of a number of successes and failures allows one to form a good idea as to which tissue should be included in the batch of vaccine in any given case. On several occasions it has proved possible to work up liver, spleen, lymph glands and brain together and secure more than a litre of vaccine from one distemper animal. There is still, however, a great deal of work necessary in order to define the conditions for the manufacture of vaccine in quantity and of uniformly good quality.

The results with a good batch of vaccine made from distemper dog tissue are really most remarkable. A single dose of 5cc. of vaccine, administered subcutaneously, will induce such a degree of resistance in the recipient, in one week, that injection of a large dose of virulent virus produces very little effect. There may be some slight fever for a day or two, accompanied by alimentary disturbance, but the dog remains cheery, active and takes its ordinary ration with gusto. The control animal has an acute fever, often vomits and refuses all food, has severe diarrhea, wastes rapidly and is nearly always dull and apathetic within four days of the onset of the disease.

Many cases in illustration might be given, but they all show that it is possible to secure from distemper dogs a vaccine which will confer almost complete protection after a single dose of 5cc. administered hypodermically.

Vaccination alone (the injection of formolized material only) is inadequate to ensure a solid and lasting immunity. Experiments showed that the resistance following vaccination is gradually lost. After three to five months some of the animals which were tested with living virus showed symptoms but ultimately recovered. In other experiments, the protection was so poor at the end of a year that one-half of the experimental animals died after the injection of living virus.

Complete Immunization of Dogs

The complete immunization is acheived as follows: Small areas of skin in the selected animals are shaved and sterilized by the application of tincture of iodin. Five cc. of vaccine are injected through the sterile area into the subcutaneous tissues by means of a syringe and fairly large hypodermic needle. The animal is put aside for 10 days. At the end of this time a quarter of a cubic centimeter of living virus (approximately a hundred fatal doses for an unvaccinated animal) is injected either into the skin or subcutaneously. *The strain of virus should be the same as that employed in the manufacture of the vaccine.* No symptoms should follow the administration of the vaccine or the virus and a fortnight after the last injection the animal should be immune to *all strains* of distemper virus.

Dogs which have been immunized by vaccines followed by living virus prove to be solidly immune. They resist large doses, not only of one strain but of all strains of distemper. They may be placed in contact with acute cases of the naturally occurring disease and do not become infected. They have further been shown to be immune to virus given intracerebrally, so that it would seem that the nervous system partakes in the general immunity. As far as can be determined the immunity is long lasting.

It should be emphasized that the complete immunization process includes the administration of living virus as a final measure; for test of resistance induced

by vaccines a potent strain of virus is used, but for field work a weak strain, which appears to have become attenuated for dogs through oft-repeated ferret passage, is employed. Further, it should be noted that the vaccinated dog which develops a mild fever following the injection of living virus does not appear to be a source of danger to susceptible animals. It is quite likely that on occasions where the response to the vaccine was poor, and where consequently the modified distemper attack following the living virus injection was severe, infection might spread, but experiments have shown that it is legitimate to carry out the whole of the immunization process in contact with susceptible animals. In no instance did infection pass from the treated animal to the susceptible companion.

In concluding the consideration of immunization, it may be pointed out, even at the cost of reiteration that crude distemper virus (distemper tissues) may be inactivated with formaldehyd, and that virus so treated forms an efficient vaccine. One dose of this vaccine renders the dog resistant to infection by some hundreds of fatal doses of the same strain of virus as was used for the manufacture of the vaccine. A dog which has received both vaccine and virus becomes immune to all strains of distemper virus.

Anti Distemper Serum

It was considered possible at the commencement of the work that dog distemper might belong to that class of diseases against which anti-bodies are produced in the blood and that it might be possible to secure a serum with valuable protective properties. As was reported previously, all the earlier experiments gave negative results, and it was stated that the immunity of the recovered dog, or ferret, was not due to circulating anti-bodies, but to the resistance of his tissues. The serum of recovered animals did not appear to delay the onset, or modify the severity of an attack of distemper. At this stage of the investigation serum from hyperimmune dogs also did not give encouraging results, and this line of investigation was abandoned for a time.

Quite recently the matter was taken on an entirely new aspect, for it has been shown to be possible to secure a serum with valuable protective properties. This advance appears to be due to the fact that we now know how to secure material very rich in virus, and the administration of this to immune animals leads to the appearance of anti-bodies in the blood. It appears to be necessary to inject some millions of infective doses, preferably more than once, into the recovered animal in order to secure a valuable serum, and the virus employed must be taken from the same species of animal as is used for the manufacture of the serum.

Little work has, so far, been carried out with the serum, as there has been considerable pressure on the staff and equipment in endeavoring to define the condition for making distemper vaccines. It seemed better policy to consolidate that success before commencing intensive work in the new channel. It may be said, however, that the serum is sufficiently potent to prevent a small dose of virus causing disease. Dog serum, which is the only serum so far secured, will only work in dogs; it does not prevent or seem to modify the disease in the ferret. It is impossible to assess the value of the new serum until much more information is available, but it should be possible, by grading the dose of virus and serum, to establish the immune state in a susceptible dog with very little bodily disturbance. It is even possible that a serum-virus-simultaneous-method (such as is employed for the prevention of hog cholera) may, in the end, prove superior to the vaccination-virus technic. It is possible that really potent serum might prevent disease after infection had occurred but before symptoms developed (serum treatment in the incubation period of the disease). It is also possible (though it is felt to be improbable) that a potent serum might be of use in treat-

ing animals in which the disease is already established. Finally, it is highly desirable from the scientific standpoint that the mode of action of protective sera in the case of diseases due to filterable viruses should be studied in detail. At the present time, as the work of Andrewes (1928) shows, the way in which these sera prevent disease is ill understood, and the older conception of their action must be reconsidered.

It is considered desirable to continue the research since the product developed offers great difficulty in its preparation and standardization. The committee will next direct its efforts to devising a means of growing the virus artificially.

The committee's findings are that there is only one strain of canine distemper and it is due to a filtrable virus. In dogs, distemper is seldom seen without complications due to secondary invaders. The mortality is low in the pure virus disease in dogs.

Anesthesia of the Cat

Dectrambre[19] strongly recommends the use of ethylchlorid, the harmlessness of which has been known for a long time, in all operations in cats. Since it is necessary that this gas should be inhaled nearly pure (undiluted), without being mixed with air, the author devised a box a little longer than the body of the animal. One end, for the posterior extremities, is closed by a door, while the other end, which is just large enough to hold the head, is provided with a strong window. Ethylchlorid is introduced through a suitably located small opening. Held fast in such a box, the animals inhale the gas in a small space and anesthesia is quickly produced, with three-fourths to two and one-half fluid drams of ethylchlorid.

Anesthesia takes place without a period of excitement, without danger of syncope due to laryngeal refles; more or les ssnoring indicates when it is complete with muscular relaxation. When this point has been reached, the animal is taken out of the box and the operation is carried out rapidly.

[19] Anesthesia of the Cat, by Mr. H. Ed. Dectrambre, in Revue Vétérinaire, November, 1928, page 622. Translated by C. H. Schultz.

Monkeys That Bite Off Their Tails

A peculiar manifestation was recently discussed at the meeting of the Paris Society D'Acclimatation. A member of this learned association, Crepin, possesses a pet monkey by the name of Madgy, a cute playful animal, which was introduced to the Society and at the banquet that followed the meeting, enjoyed all the delicacies that were given her.

This animal however, during the past months ate up two-thirds of its tail. Such autophagies are not a rare occurrence with monkeys. In the Zoological Gardens, these animals arrive frequently with badly mutilated tails, and it has been noticed also that dogs and hyenas occasionally bite off parts of their tail. What demon induces these animals to look for their food at the hind part of their body? The opinions on this respect are very divided. Some veterinarians claim that such self eaters, as a rule are mentally affected, and that their brains are damaged by some infection. Others claim that there are some irritations on the tail, such as an itching or some kind of a rash, causing the animal to rid himself of this part of the body where they suspect the cause of the pain is.

Others at the meeting, especially emphasized the fact that an animal that bites off his tail cannot have strong senses of pain, and that very few painful nerves are located in this place. Everyone however, who has stepped on the tail of a dog or cat will doubt this statement.

Another theory was given, that these animals want to have a necessary addition to their food, as the monkey for instance does not live on plants alone, for he eats everything. Madgy, the monkey that gave cause to these observations, is very fond of flies, insects and spiders, so that she seems to have a certain need of meat diet, and as she could not get it any other way, she possibly made the best of it by chewing off her tail.

Anyway this is a puzzle which is as yet unsolved.—Tr. by A. E.

JOHN G. EAGLE

John G. Eagle of Kansas City, Mo., died Nov. 20th, 1928. Doctor Eagle was a graduate of the Kansas City Veterinary College in the 1904 class and accepted an appointment as veterinarian in the B. A. I. immediately after graduation, and served in that capacity for 10 years, when he resigned to accept the position of vice-president of the Eagle Serum Company of Kansas City.

In 1924, Dr. Eagle was elected to the lower house of the city council of Kansas City, Mo., and in 1925 he was appointed superintendent of the Detention Home.

Doctor Eagle was of sterling quality, having made a splendid record while in B. A. I. service, was recognized as efficient, honest and conscientious in the production and sales of biologics and a city official of integrity. He was of a family of veterinarians, having three brothers, Dr. R. F. Eagle, of the Wilson Packing Co., Dr. Thomas Eagle of the Tuberculosis eradication division of the B. A. I., Dr. Wallace Eagle, present owner of the Eagle Serum Co., a brother-in-law, Dr. Robert B. Grimes, veterinarian for the Kansas Livestock Commission, and two cousins, Dr. A. F. Eagle, City veterinarian of San Francisco, and Dr. J. N. Eagle, of Kansas City, Kansas, in the profession.

CHANGES IN THE ARMY VETERINARY SERVICE

Regular Army

So much of War Department orders as assigned Captain Charles S. Williams to Camp Knox, Kentucky, is amended so as to assign him to Fort Reno, Okla., upon completion of his present tour of foreign service.

Reserve Corps

New acceptances:

Karstendiek, Edward Francis, Capt., 1233 Dryades St., New Orleans, La.

Morse, John Robertson, Capt., E. Main Extension, Middletown, N. Y.

Patton, John Wesley, 1st Lt., 432 Butterfield Drive, East Lansing, Mich.

Separations:

Staley, Raymond M., Lt. Col. Appointment terminated 11-27-28.

Fawver, J. Roy, Capt. Failed to accept reappointment.

Fretz, Victor C., 2nd Lt. Failed to accept reappointment.

Stafseth, H. J., 1st Lt. Failed to accept reappointment.

ARKANSAS LICENSES

The Arkansas Veterinary Examining Board will convene in the office of the State Veterinarian at Little Rock January 25, 1929, for the purpose of prescribing examination and extending reciprocity with states having this arrangement for applicants who desire to become licensed to practice in Arkansas, and such other routine matters as may demand consideration.—J. H. Bux, Sec.

A son, Thomas Glenn, was born to Dr. and Mrs. G. A. Roberts, who are spending in the U. S. a year's leave of absence from the doctor's duties at the Brazil Agricultural College, Minas, Brazil. The Roberts will return to Brazil as soon as the young man is able to travel.

W. J. Pirie of Springville, Iowa, who has won most of the championships to be had with his Plymouth Rock chickens at Iowa state and county fairs, has this year invaded New England with the result customary to him. Nine birds exhibited at the New England branch of the International Partridge Plymouth Rock Association's meet at Athol, Massachusetts, were awarded the grand champion display of the show. In addition, Doctor Pirie captured the first hen and first pullet awards, the premiums for second old pen, second cockerel and fifth cock, besides many special premiums.

ALABAMA VETERINARIANS MEET IN AUBURN

The next meeting of the Alabama Veterinary Medical Association will be held during the week of the short course for graduate veterinarians at the Alabama Polytechnic Institute, Auburn, February 4-9, 1929. For particulars, address C. A. Cary, Auburn, Ala.

THE HALL OF FAME

The Wisconsin State Journal of December 29, 1928, makes three nominations for the Hall of Fame. One of these nominations is "Father Time," another Commander Richard E. Byrd, and a third, A. S. Alexander. As the reasons for nominating Doctor Alexander to the Hall of Fame, the Journal says:

"Because the latest book by this beloved Madisonian, a scientific treatise on dairy cattle diseases and treatment, published last summer, is being used by agricultural students, farmers and veterinarians throughout the country; because he remembers and recognizes on sight hundreds of former students under him, whose names he always memorized for roll call; because despite a knee injury 30 years ago that prevented much of desired participation in the sports, hunting and fishing that he loved, he has maintained a sunny, cheerful disposition, replete with wit and canny observations in his teachings and writings; because his intellectual activity scope ranges from the work of the naturalist and lover of the out-of-doors, to veterinary science, Scottish poetry, short stories, 40 years of journalism for the farm press of the country, illustrated travel lectures and humanitarian discussion; because he originated the stallion license law in Wisconsin in 1905, a law that has been patterned after in 26 other states; because he also originated the Purebred Sire League in 1911, the first such organization in the United States and a forerunner of a campaign against indiscriminate usage of scrub sires in breeding; because Dr. Alexander has been characterized, and rightly, as a 'helper of men.'"